Roll No./रोल न._____

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B. TECH. SEMESTER-I (WINTER-2019)

BT111 COMMUNICATIVE ENGLISH

Time – Three Hours Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question.. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Each question carries 10 marks.

PART – A

1. i Fill in the blanks with the correct form of verb:
   (a) He usually…….tea in the evening. (take)
   (b) Ramleela……..organized next week. (future tense)
   (c) Mahesh has…….Diwali. (celebrate)
   (d) Birds usually……..in the evening. (chirp)

   ii Change into passive:
   (a) Radha has washed clothes.
   (b) She was writing a letter.

   iii What is precis writing?
   iv Write a paragraph on 'Advantages of Social Media'.
   v Describe the views of O. Henry on 'The Last Leaf'.
   vi What is the theme of 'The Unknown Citizen' by W. H. Auden?
   vii Do you think that S. Radhakrishnan was a modern essayist?
   viii Who was Behrman?
   ix Describe the dream of Behrman.
   x Write down the importance of a report.

PART – B

2. i Change the following sentences into indirect sentences:
   (a) Radha said to me, "I am well".
   (b) She said to him, "you have done the task".
   (c) Anmol said to Krishna, "go out".
   OR
   ii Fill in the blanks with suitable modals:
   (a) He…….do math's problems.
   (b) Rajesh is very late. He…….catch the train.
   (c) You are ill. You…….take rest.

3. i Write a short paragraph on 'Importance of Education'.
   OR
   ii Write a dialogue between two new students in a school.

4. i Who were Sue and Johnsy?
   OR
   ii What is the theme of 'Our Own Civilization'?

5. i Describe the characters in 'How Much Land Does a Man Need'.
   OR
   ii Write about the friendship between Sue and Johnsy.

6. i 'The Unknown Citizen' is a well organized poem by W. H. Auden. Justify the statement.
OR
ii Describe the theme of 'No Men are Foreign'.

PART – C

7. Write down the significance of paragraph and report?

8. Re-arrange the following sentences:
i Better/than/is/something/nothing.
ii Bala/role/important/plays/an.
iii Anand/friend/Akshay/is/of.
iv He/class/in/sits/the.
v College/teaching/now-a-days/is/in/he.

9. Write the summary of 'The Luncheon' by W. S. Maugham.

10. A. G. Gardiner is one of the finest essayists among all essayists. Describe.

11. What kind of role does Henry play? Discuss.

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प्रश्नपत्र पर क्रमांक (रोल नम्बर) के अतिरिक्त कुछ भी लिखना अनुचित साधनों का प्रयोग माना जायेगा तथा नियमानुसार कार्यवाही की जायेगी।

B. Tech. Semester-I (WINTER-2019)

BT112 ENGINEERING MATHEMATICS-I

Time – Three Hours | Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C... Each question carries 10 marks.

PART – A

1. i Define asymptotes.

   ii Define 'singular point'.

   iii State Euler's theorem on homogeneous function.

   iv If $lim\ (1 + ax + bx^2)^{2/x} = e^3$, then find a and b.

   v State Taylor's theorem for functions of two variables.

   vi Evaluate : $\int_{-1}^{2}\int_{-3}^{3}(y^2 - 3xy)\ dxdy$.

   vii Evaluate : $\sqrt{-\frac{5}{2}}$

   viii If $\vec{r} = 3\hat{\imath} - 4\hat{\jmath} + 2\hat{k}$ then find, div$\vec{r}$.

   ix If $\vec{a} = 2\hat{\imath} + 4\hat{\jmath} - 5\hat{k}$ and $\vec{b} = 2\hat{\imath} - 8\hat{\jmath} + 6\hat{k}$, then find $\vec{a}\times\vec{b}$.

   x Define gamma function.

PART – B

2. i Prove that the asymptotes of the following curve form a square and the curve passes through two of its vertices: $x^2y^2 - a^2(x^2 + y^2) - a^3(x + y) + a^4 = 0$

   OR

   ii Find the points of inflexion of the following curve: $y = 3x^4 - 4x^3 + 1$.

3. i If $u = \log(x^3 + y^3 + z^3 - 3xyz)$, then prove that:
   (a) $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = \frac{3}{x+y+z}$
   (b) $\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z}\right)^2 u = \frac{-9}{(x+y+z)^2}$

   OR

   ii If $u = f(y - z, z - x, x - y)$, then prove that: $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$.

4. i The period of a simple pendulum with small oscillation is $T = 2\pi\sqrt{\frac{l}{g}}$. If T is computed using $l = 8\,m$ and $g = 9.8\,m/sec^2$. Find the approximate error in T, if the true values are $l = 8.05\,m$ and $g = 9.81\,m/sec^2$. Also find the % error in T.

   OR

   ii Find the max. or min. value of the following function: $u = xy + \frac{a^3}{x} + \frac{a^3}{y}$

5. i Find the volume of spindle shaped solid generated by revolving the asteroid about the x-axis.
   $x = a\,cos^3t,\ y = a\,sin^3t$ **or** $x^{2/3} + y^{2/3} = a^{2/3}$

   OR

   ii Evaluate $\int_A \int ydxdy$, where A is the region of integration bounded by the parabola $y^2 = 4ax$ and $x^2 = 4ay$.

6. i If $\vec{r} = x\hat{\imath} + y\hat{\jmath} + z\hat{k}$ and $r = |\vec{r}|$ then prove that:
(i) $\nabla f(r) = f'(r)\,\nabla r$
(ii) $\nabla \log |r| = \frac{1}{r^2}\vec{r}$

OR

ii If $\vec{r}$ and r have their usual meaning; show that div $r^n\,\vec{r} = (n+3)r^n$. Further prove that $r^n\,\vec{r}$ is solenoidal if $n = -3$.

PART – C

7. Trace $y^2(a+x) = x^2(a-x)$.

8. In a ΔABC, find the maxima and minima of $u = \sin A \sin B \sin C$, where $A + B + C = \pi$.

9. If $u = \sin^{-1}\left(\frac{x}{y}\right) + \tan^{-1}\left(\frac{y}{x}\right)$, then prove that: $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = 0$.

10. Prove that: $\int_0^1 \frac{x^{m-1}+x^{n-1}}{(1+x)^{m+n}}\,dx = B(m, n)$.

11. State Gauss theorem and show that $\int_S (ax\hat{\imath} + by\hat{\jmath} + cz\hat{k}).\hat{n}ds = \frac{4}{3}\,\pi\,(a+b+c)$, where S is the surface of the sphere $x^2 + y^2 + z^2 = 1$.

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B. Tech. Semester-I (WINTER-2019)

BTCI113 ENGINEERING PHYSICS-I

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What is Hall effect?
   ii Define covalent bonding.
   iii Write postulates of special theory of relativity.
   iv Lorentz length contraction takes place in which dimensions of the rod?
   v What is the maximum order of spectrum that can be obtained by grating?
   vi Write an expression for angular width of central maximum in the diffraction due to single slit.
   vii What is quarter wave plate?
   viii State Brewster's law.
   ix What do you mean by anti reflection coating?
   x What optical path difference is produced by a thin transparent film of refractive index μ and thickness t when placed in the path of any one way?

PART – B

2. i Answer the following:
   (a) Calculate the thickness of half wave plate for sodium light ($\lambda = 5893$ Å, $\mu_0 = 1.544, \mu_e = 1.553$).
   (b) How will you detect whether given light beam in unpolarised plane polarized by polariser?

   OR

   ii Explain the construction and working of quarter wave and half wave plates.

3. i In Newton ring experiment the diameter of 5^{th} and 15^{th} ring is 0.336 cm 0.590 cm, respectively. If the wavelength of light is 5890 Å, then find the radius of curvature of the lens used.

   OR

   ii Sodium light is used in Michelson interferometer. The average wavelength of sodium light is 5893 Å. A movable mirror is moved through a distance of 0.00289 cm to obtain two consecutive positions of indistinct fringes. Find the distance between two close lying wavelengths of sodium light.

4. i Discuss the theory of a plane transmission grating.

   OR

   ii What is resolving power of microscope? Derive an expression for it using Rayleigh's criterion.

5. i Use Lorentz's transformation to show that $x^2 + y^2 + z^2 - c^2t^2 = x'^2 + y'^2 + z'^2 - c^2t'^2$.

   OR

   ii Calculate the percentage length contraction of a rod moving with velocity of 0.8c in direction of its length.

6. i Classify the conductors, insulators and semiconductors on the basis of energy band theory.

   OR

   ii Explain conduction in semiconductors.

PART – C

7. i Prove that the Hall coefficient is independent of applied magnetic field and inversely proportional to current density and electronic charge.

   ii A rod of intrinsic Germanium is of size 1cm x 1mm x 1mm. Find its resistance at 300 K.
   (At 300 K, n_i = 2.5x10^{13}/cm^3, μ_e = 3900 cm^2/V-S, μ_n = 1900 cm^2/V-S)

8. i Deduce the following relativistic energy-momentum relation $E^2 = p^2c^2 + m_0^2c^4$.

   ii Derive mass energy relation $E = mc^2$.

9. Discuss the phenomenon of Fraunhofer diffraction at single slit and show the relative intensities of the successive maxima.

10. Explain the principle and working of bi-quartz polarimeter. How will you determine the specific rotation of material using it?

11. Describe and explain the formation of Newton's rings in reflected monochromatic light. Derive the condition of bright and dark fringe formation.

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B. TECH. SEMESTER-I (WINTER-2019)

BT114/BTCI114 ENGINEERING CHEMISTRY-I

Time – Three Hours | Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Why are fossil fuels bad?
   ii What is synthetic kerosene?
   iii What is main purpose of proximate analysis of coal?
   iv Which type of coal is the most energy efficient?
   v What is polymer and what is it made of?
   vi How do you identify a polymer?
   vii What is formula of cement?
   viii Why addition of magnesia and alumina effect the soda lime glass?
   ix Give the example of single oxide refractory.
   x Draw the layer structure of graphite.

PART – B

2. i Explain characteristics of good fuel.
   OR
   ii What are the advantages of organic fuels? Discuss.

3. i Give differences between proximate analysis and ultimate analysis of coal.
   OR
   ii What is Dulong's formula? How is calorific value calculated?

4. i How are polymers classified? Explain with suitable example.
   OR
   ii Write a note on electrically conducting polymer.

5. i Write a note on hardening and setting of cement.
   OR
   ii Write a note on total internal reflection in optical fibres.

6. i Define viscosity and viscosity index.
   OR
   ii Write a note on porosity and heat capacity.

PART – C

7. What is synthetic petrol? Explain the manufacturing of petrol by Fischer-Tropsch process.

8. Calculate the gross and net calorific value of a coal sample having the following composition:
   C = 80%, H = 7%, O = 3%, S = 3.5%, N = 2.1% and ash = 4.4%.

9. Write note on the following:
   i Poly (p-phenylene sulfide)
   ii Polypyrrole
   iii Polyaniline
   iv Polythiophene

10. Describe properties and uses of different silicate glasses and also discuss the importance of annealing in the manufacture of glass.

11. What are refractory materials? Explain Seger Cone test and RUL test for refractory materials.

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B. Tech. SEMESTER-I (WINTER-2019)

BT115 BASIC ELECTRICAL & ELECTRONICS ENGINEERING

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What is faraday's law of electromagnetic induction?

   ii Write Kirchhoff's law.

   iii What do you mean by phase diagram?

   iv Define average value of alternating currents and voltage.

   v Write two applications of DC machine.

   vi Write two applications of AC machine.

   vii What do you mean by rectifier?

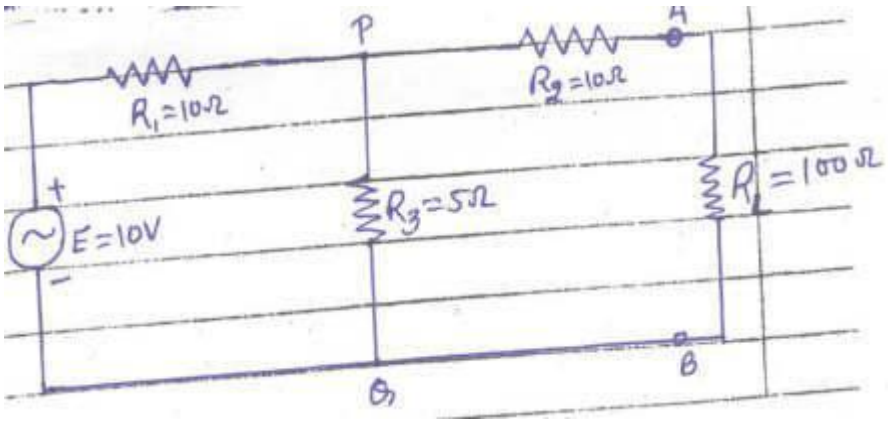
   viii Prove that $AC + \bar{A}BC = AC + BC$

   ix Define transducer.

   x Draw IEEE spectrum.

PART – B

2. i Obtain the Thevenin Equivalent Circuit and calculate the current following through R_L.



OR

ii State and prove Norton's theorem.

3. i Explain single phase RLC circuit.

OR

ii Discuss three phase AC circuit.

4. i Explain principle of operation of DC machine as motor and generator.

OR

ii Discuss 3-phase synchronous generator.

5. i Explain field effect transistor.
OR
ii Discuss input and output characteristic curve of common emitter transistor configuration.

6. i Write short note on types of communication.
OR
ii Write short note on transducers.

PART – C

7. i State and establish maximum power transfer theorem.
ii A generator develops 200 volts and has an internal resistance of 100 ohm. Find the value of power delivered to a load by applying 100 Ω and 400 Ω from this generator.

8. Find out the average value and RMS value of AC voltage and current and also give phase diagram.

9. Describe in detail the construction and working of induction motor.

10. Explain the rectifier and derive the co-efficient for L, C and LC filter.

11. Write a short note on ICs.

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B.Tech. Semester-I (WINTER-2018)

BT116 COMPUTER APPLICATION

Time – Three Hours Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question.. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Each question carries 10 marks.

PART – A

1.

i Define operating system.

ii What is an algorithm?

iii What is 2's complement?

iv What is ASCII code?

v What is Format Painter?

vi What do you mean by alignment of text?

vii What do you mean by Intranet?

viii What is a smart card?

ix What is cloud computing?

x What do you mean by open source?

PART – B

2. i Explain memory hierarchy in detail.
OR
ii Explain the architecture of computer with a neat labeled diagram.

3. i Explain binary addition and subtraction.
OR
ii Explain character representation codes.

4. i Explain any three in brief:
a)Desktop b)Recycle Bin c)Character Map d) TaskBar
OR
ii Explain formulas in MS-Excel.

5. i Explain cryptography and digital signatures.
OR
ii Explain following terms :
a) Web browser b) Internet c) Search engine.

6. i Explain Bluetooth and Wi-Fi.
OR
ii Explain Decision Support System.

PART – C

7. Explain any two input and output devices each.

8. Convert the following:
   a) $(101011)_2 = (\ )_{10}$
   b) $(79)_{10} = (\ )_{16}$
   c) $(56)_8 = (\ )_2$
   d) $(A1)_{16} = (\ )_{10}$

9. Explain any two :
   a) Mail merge in MS Word
   b) Charts in MS Excel
   c) Types of Views in MS Powerpoint

10. Explain LAN, MAN and WAN in detail.

11. Explain application of IT in areas on e-commerce and electronic governance.

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B.TECH. SEMESTER-II (SUMMER-2019)
BT211 COMMUNICATIVE ENGLISH

Time – Three Hours | Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Define communication in your own words.

   ii What is media? What is the role of media in communication?

   iii What is verbal communication?

   iv Write any five qualities of a good communication.

   v Discuss the major barriers to communication.

   vi How will you improve the methods of communication?

   vii What is an e-mail?

   viii What are the features of a good and effective resume?

   ix Find out the common errors in the following sentences:
      i) It is very good weather
      ii) She sat in the end of the table

   x Fill in the blanks with correct verb/helping verb:
      i) They used to _____cricket. (play/played)
      ii) We_____happy. (is/where)

PART – B

2. i What is the importance of communication in business?
   OR
   ii Write down the main objectives of communication with description.

3. i What is the difference between formal and informal channels of communication?
   OR
   ii What do you understand by the term verbal and non-verbal communication?

4. i What is professional communication? Give your answer with suitable description.
   OR
   ii How will you describe interpersonal communication skills?

5. i Fill in the correct conjunctions and linking words:
   a) He likes all kinds of sports_____skiing hockey and volley balls.
   b) You can have_____ tea _____coffee for breakfast.
   c) First cut out the pictures, _____give them into you album.
   [**Hint words**: Although, during, either, or, because, then, such as]

   OR

   ii Write relative clause: Who/that/which in the blanks:
   i. I met a woman_____can speak six languages.
   ii. Why does he always wear clothes_____are too small for him?
   iii. She always asks me questions_____are difficult to answer.

6. i What things should be kept in mind while talking with others via telephone?

   OR

   ii Draft an email to the director of a software company suggesting him to open a canteen for the workers.

PART – C

7. Explain the major objectives of communication with suitable examples. What are the types of communication?

8. Describe the formal and informal channels of communications with the help of diagram.

9. What is the difference between barriers to communication and professional communication?

10. Imagine yourself as Varun and you have done M.Tech. Write a letter to the principal of Doon Public School, Jodhpur for the post of PGT (Maths). Apply with good and effective resume with this letter.

11. Write a short note on "Clean India Mission"

Roll No./_____

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B.TECH Semester-II (SUMMER-2019)

BT212 ENGINEERING MATHEMATICS-II

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Define row matrix and column matrix.

   ii State Cayley-Hamilton theorem.

   iii What do you understand by even and odd function?

   iv Write down the fourier series

   v Define homogenous differential equation.

   vi Explain symbols D, 1/D, $1/D^2$ in solving linear differential equation.

   vii Solve $(D^2 + 3D + 2)y=0$

   viii Explain the conditions for second order linear differential equations to be exact.

   ix What is meant by integrating factors for a linear differential equation of second order?

   x Write auxiliary equations of Charpit's method.

PART – B

2. i Test the consistency of the following system:
   i. If equations and if possible, solve it:

   $$2x-3y+7z = 5$$
   $$3x+y-3z = 13$$
   $$3x+19y-47z = 32$$

   OR

   ii Find the rank of the given matrix by reducing it to the normal form

   $$A=\begin{bmatrix}3 & 2 & -1\\ 4 & 2 & 6\\ 7 & 4 & 5\end{bmatrix}$$

3. i Prove that $b_n=\frac{2}{N}\sum f(x)sinnx$

   OR

   ii The following table gives the variation of a periodic current over a period

t(sec)	0	t/6	t/3	t/2	2t/3	5t/6	t
A(amp)	1.98	1.30	1.05	1.30	-0.88	-0.25	1.98

   Show by harmonic analysis that their current part of 0.75Amp in the variable current and obtain the amplitude of first harmonic

4. i Solve :

a) $(1+y^2)+(x-e^{tan^{-1}y})\frac{dy}{dx}=0$

b) $(xy^2+2x^2y^3)dx+(x^2y-x^3y^2)dy=0$

OR

ii Solve:

a) $\frac{dy}{dx} = e^{x-y}(e^x - e^y)$

b) $(D^3+3D^2+2D)y = x$

5. i Solve the following differential equation:
$(D^4+2D^3-3D^2)y=3e^{2x}+4\sin x$

OR

ii Solve for differentiability $\frac{d^3y}{dx^3} + \frac{2d^2y}{dx^2} + \frac{dy}{dx} = e^{2x} + x^2 + x$

6. i Solve: $z-xp-yq= a\sqrt{x^2 + y^2 + z^2}$

OR

ii Solve: $x^2p^2+ y^2q^2=z^2$

PART – C

7. Find the characteristics equation of the matrix:
$A=\begin{bmatrix} 2 & 1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$ show that the matrix A satisfies it. Hence find A^{-1}

8. Express f(x) in a fourier series upto the second harmonic for the following data:

x	0	π/3	2 π/3	π	4π/3	5π/3	2π
f(x)	1.98	2.15	2.77	-0.22	-0.31	1.43	1.98

9. Solve $\frac{dy}{dx} = \left(\frac{2x-y+1}{x+2y-3}\right)$

10. Solve $(D-1)^2(D^2+1)^2y = \sin^2\frac{x}{2}e^x$

11. Solve $(p^2+q^2)y=qz$ {by Charpit's method}

Roll No./_____

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B.TECH. SEMESTER-II (SUMMER-2019)

BT213 ENGINEERING PHYSICS-II

Time – Three Hours | Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i A photon scattering angle is 180^0 then calculate maximum Compton shift.

   ii Write general properties of Schrodinger's equation.

   iii Define degeneracy.

   iv Write one postulate of Summerfield's theory.

   v Draw a diagram of ionization chamber.

   vi Define "dead time" of counter.

   vii What is the principle of optical fiber and its issues?

   viii Define "Q" factor for light.

   ix Write any three uses of laser.

   x What is stimulated emission of radiation?

PART – B

2. i Obtain a relation between transition probabilities of spontaneous and stimulated emission.
   OR
   ii Explain basic theory of holography.

3. i Define coherence term. A Laser line width as low as 20Hz occur. Calculate the coherence length.
   OR
   ii Distinguish between spatial and temporal coherence in laser emission.

4. i Write the comparison of characteristic curves of ionization chamber, proportional counter and G.M counter.
   OR
   ii Draw a diagram of proportional counter and explain its working.

5. i A one dimensional box width is $10A^0$, Calculate probability in range $1A^0$ at centre of box when particle is in ground energy level.
   OR
   ii A box width is a. Calculate probability of particle in first excited energy level between .45a to .55a ($\sin 36^0 = .588$)

6. i Calculate kinetic energy of recoil electron in Compton scattering if photon wavelength $3A^0$ and scattering is 90^0.
   OR
   ii Write time independent Schrodinger equation and explain its stationary state solution.

PART – C

7. Derive energy eigen value and eigen function for a particle one dimensional box. Explain discrete energy levels.

8. A rectangular potential barrier height is V_0. Calculate transmission coefficient and tunnel effect.

9. Discuss spatial coherence as related to the size of the source. Obtain expression for lateral spatial coherence width and give its significance.

10. Describe a He-Ne gas laser. How is population inversion achieved in this type of laser? Mention advantages of a gas laser over a solid state laser.

11. Draw a diagram of scintillation counter and explain its working and principle.

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B.TECH SEMESTER-II (SUMMER-2019)
BT214 ENGINEERING CHEMISTRY-II

Time – Three Hours | Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART-A

1. i Which source of water is free from hardness and surface impurities?

   ii What are the disadvantages of using high alkaline water?

   iii What is the chemical formula of Zeolite?

   iv What is the function of coagulant?

   v What do you understand by food web?

   vi What is the chemical composition of the atmosphere?

   vii What is the difference between primary and secondary air pollutants?

   viii Write the names of some diseases if we drink polluted water.

   ix What is Ecotone?

   x What is corrosion?

PART-B

2. i Describe Clark's method for removal of temporary hardness of water.
   OR
   ii Estimation of hardness of water by EDTA method procedure.

3. i Explain ion exchange technology for water softening process.
   OR
   ii What is boiler corrosion? How it is controlled?

4. i Why EPA is called umbrella act? Explain it.
   OR
   ii Explain hydrological and chemical cycle.

5. i What is global warming and causes behind it?
   OR
   ii Explain ozone layer depletion.

6. i What is waste water and how it is generated? Explain.
   OR
   ii Describe the effect of the corrosion protection system.

PART-C

7. What is sedimentation and coagulation? Explain complete process of purification of water.

8. Explain Permutit process with suitable diagram.

9. What is environmental regulation and important environmental laws? Explain it?

10. Explain acid rain and control of air pollutions.

11. Explain mechanism of dry and wet corrosion.

Roll No./_____

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B.TECH SEMESTER-II (SUMMER-2019)
BT215 ENGINEERING MECHANICS

Time – Three Hours | Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART-A

1. i State Lami's theorem.

   ii State Varignon's theorem.

   iii What is velocity ratio?

   iv Define polar moment of inertia.

   v What is friction?

   vi Define angle of repose.

   vii State Newton's three laws of motion.

   viii Define couple.

   ix State D'Alembert's principle.

   x What do you mean by non conservative force?

PART-B

2. i Explain the concept of free body diagram.
   OR
   ii Discuss principle of virtual work.

3. i Explain parallel axis theorem.
   OR
   ii Describe perpendicular axis theorem.

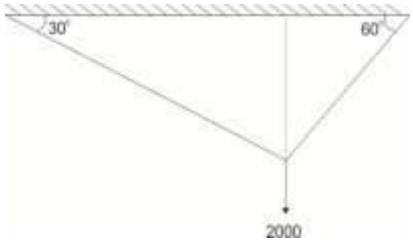
4. i Discuss different types of belts?
   OR
   ii Derive an expression for the ratio of power transmission by flat belt derivatives.

5. i Derive an expression for the maximum horizontal range in projectiles.
   OR
   ii Derive an expression for the maximum vertical range that has been allowed for maximum horizontal range.

6. i What are the principles of angular momentum?
   OR
   ii Discuss the principles of impulse?

PART-C

7. A weight of 2000 N is supported by two chains AC and BC as shown in the figure below. Determine the tension in each chain:



8. The moment of inertia of rectangular section beam about X-X and Y-Y axes passing through the centroid are 250 x 10^6 mm^4 and 40 x 10^6 mm^4; respectively. Calculate the size of the section.

9. A body is resting on a rough horizontal plane required a pull of 24 N inclined at 30° to the plane just to move it. It was also found that a push of 30 N at 30° to the plane was just enough to cause motion to impend. Make calculations for the weight of body and the coefficient of friction.

10. Consider a particle moving in a circular path than prove that:
    (a) Normal acceleration $a_n \frac{v^2}{r}$
    (b) Normal velocity $V_n = 0$

11. Explain work energy principle.

Roll No./_____

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B.TECH. SEMESTER-II (SUMMER-2019)

BT216 PROGRAMMING IN C LANGUAGE

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What do you mean by increment and decrement operators?

   ii What do you mean by void?

   iii Differentiate between while and do while loop.

   iv What do you mean by continue keyword?

   v How are array elements indexed?

   vi What is void pointer?

   vii What is recursion?

   viii What is the default return type in a function?

   ix Differentiate between macro and a function.

   x What do you mean by preprocessor directive?

PART – B

2. i Explain fundamental data types.
   OR
   ii Explain relational, arithmetic and logical operations.

3. i Explain nested if else construct with help of an example.
   OR
   ii Write a menu driven program using switch case to perform all arithmetic binary operations on two input numbers.

4. i What are 2D arrays? How are they stored in memory?
   OR
   ii What are pointers? How are they declared and what are its applications?

5. i Differentiate between structure and union.
   OR
   ii What are enumerated data types? Explain.

6. i What is a macro? Explain how they are substituted with help of an example.
OR
ii Explain fscanf and fprintf.

PART – C

7. Explain
a)Storage classes
b) Write an algorithm and flowchart to add two numbers.

8. Explain for loop. Write a program to print table of a input number till 10.

9. What are arrays? How are they declared and initialized? Write a program to search a given integer from a 1D array and display its position if it exists.

10. What are functions? In how many ways values can be passed to a function? Explain with help of an example.

11. Explain file handling in C in detail.

Roll No./रोल न._____

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B. Tech. (COMPUTER SCIENCE) Semester-III (WINTER-2019)
BTCS311 DIGITAL ELECTRONICS

Time – Three Hours Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1.

i Represent decimal number 7026 in BCD and Excess-3 codes.

ii Convert the hexadecimal

iii What is minterm?

iv Explain Demorgan's Laws

v Draw a neat labeled diagram of half-adder circuit using basic gates.

vi What is a full subtractor? Give its truth table

vii What is race around condition? What is its solution?

viii What do you mean by state diagram?

ix What do you mean by terms "fan in" and "fan out"?

x Write any two advantages of CMOS.

PART – B

2. i Why the gray code is also known as reflected code? Write a brief note on gray code and its applications.
OR
ii Convert the following
$1011_2 = (?)_{16}$ ii. $777_8 = (?)_{10}$ iii. $5AB_{16} = (?)_{10}$

3. i Minimize the 4 variable Boolean function using K-map:
$f(A,B,C,D) = \sum m(1,2,3,7,8,9,10,11,14,15)$
OR
ii Distinguish between min terms and max terms.

4. i What is an encoder? Draw the logic circuit of Decimal to BCD encoder and explain its working.
OR
ii Implement the following function using a 3 line to 8 line decoder.
$S(A,B,C) = \sum m(1,2,4,7)$
$C(A,B,C) = \sum m(3,5,6,7)$

5. i Write a note on Mealy and Moore machines.
OR
ii Write a note on noise margin.

6. i What is the necessity of Interfacing in digital ICs and what are the points to be kept in view, while interfacing between TTL gate and CMOS gate?
OR
ii Give the circuit of a TTL NAND gate and explain its operation in brief.

PART – C

7. Implement the following Boolean expression using universal gates.
G(A,B,C,D,E,F)= BE+ACF+ACDF

8. Simplify the following Boolean function using tabulation method:
F= $\sum$m(0,1,2,8,10,11,14,15) . d(9,12)

9. Design a full adder using 4x1 multiplexer.

10. How will you convert R-S flip flop into J-K flip flop? Also discuss characteristic table of J-K Flip flop.

11. Write a note on various IC logic families

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B. Tech. (COMPUTER SCIENCE) Semester-III (WINTER-2019)

BTCS312 ELECTRONIC DEVICES AND CIRCUITS

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(A) or (B)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Draw symbol of NPN and PNP transistor.
   ii Write the names of semiconductor used in solar cell.
   iii Draw input and output wave form of positive clamping.
   iv Draw circuit diagram of negative clipping circuit.
   v Write criteria for oscillation.
   vi Why CE configuration is preferred in oscillator circuit?
   vii For a transistor $\alpha = 0.9$, calculate value of β.
   viii What is Q-point?
   ix Draw a circuit diagram of emitter follower.
   x What is a coupled amplifier?

PART – B

2. i What is voltage multiplier? Draw circuit diagram and explain in short.

   OR

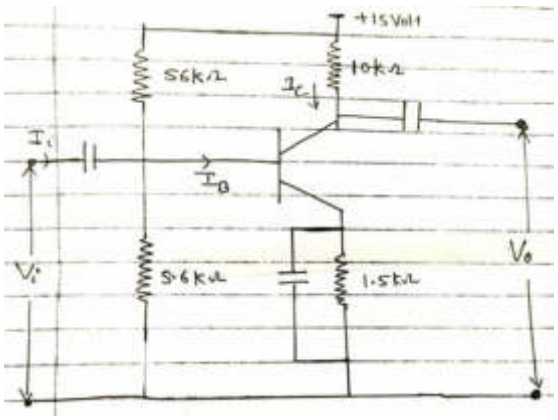
   ii A P-N junction diode saturation current is 40 μA and forward bias condition applied voltage is 0.1 Volt, then calculate diode current I ($e/KT=40V^{-1}$).

3. i Write full name of LED. Explain its construction, working principle and uses.

   OR

   ii Draw symbol of photodiode and explain its construction, working principle and uses and characteristic curve.

4. i For a circuit $\beta = 90$, $h_{Fe} = 2.8$ K Ω, calculate value of R_i, R_o, A_v, A_i.



   OR

   ii The hybrid parameters for transistor uses CE configuration are $h_{ie} = 1.5$ K Ω, $h_{re} = 10^{-4}$, $h_{Fe} = 70$, $h_{oe} = 100$ μΩ, load resistance is 1 KΩ in the collector lead and is supplied from a signal source of resistance 800 Ω. Calculate R_i, R_o, A_v, A_i.

5. i Write statement of Miller's theorem and prove it.

OR

ii Draw FET small signal model circuit and explain its working.

6. i A tuned collector oscillator employs a transformer whose primary conductance is 10 mH. The capacitor connected across the primary has a capacitance of 100 PF. The d.c. resistance of primary coil is 10 Ω and the transistor used has h_{ie} = 1 K Ω, h_{Fe} = 50, $h_{re} = 10^{-4}$, $h_{oe} = 10^{-4}$. Find the frequency of oscillation and mutual inductance.

OR

ii Solve the following:

(a) Find the operating frequency of a transistor Colpitts oscillator if c_1 = 0.001 μF, c_2 = 0.001 μF, L = 15 μH.

(b) The a.c. equivalent circuit of a crystal has the value L = 1 H, C = 0.1 PF, R = 1000 Ω, C_m = 20 PF. Calculate F_S of the crystal.

PART – C

7. Discuss working of shunt and series diode clippers circuit. Draw input and output waveform.

8. i Draw JFFT (N-channel) circuit and drain characteristics. Prove that amplification factor is $\mu = \gamma_d g_m$.
($\gamma_d \rightarrow$ drain resistance and $g_m \rightarrow$ mutual conductance)

ii Write differences between FET and junction transistor.

9. Define stability factor and biasing of transistor. Derive an expression for the fixed bias circuit and self or emitter bias.

10. What is meant by an ideal difference amplifier? Explain differential gain and common mode gain of differential amplifier.

11. Draw the circuit diagram of Colpitts oscillator and obtain the expression for the frequency of oscillations.

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B. TECH. (COMPUTER SCIENCE) SEMESTER-III (WINTER-2019)

BTCS313 DATA STRUCTURES AND ALGORITHMS

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Give the difference between linear and non linear data structure.

   ii Explain complexity.

   iii What is Queue?

   iv What is Stack?

   v Give the definition of the following terms :-
   (a) Degree of tree. (b) Depth of tree.

   vi What is 'Binary tree'?

   vii What do you mean by In Degree and Out Degree in graph?

   viii What is 'Directed Graph'?

   ix Explain the concept of 'Linear Search'.

   x What do you mean by 'Hashing'?

PART – B

2. i What is array? Also explain row-major order and column-major order with suitable example.
   OR
   ii Explain linked list, doubly linked list and circular linked list with suitable example.

3. i Write an algorithm for push and pop operation in stack.
   OR
   ii Explain insertion and deletion operation in queue with suitable example.

4. i Explain 'Multi Way Tree' with suitable example.
   OR
   ii Explain 'B Tree' with suitable example.

5. i Explain representation of graph in memory with suitable example.
   OR
   ii Explain 'Spanning Tree' with suitable example.

6. i Explain the concept of 'Hashing' with suitable example.
   OR
   ii Explain 'Selection Sort' with suitable example.

PART – C

7. Explain big oh, omega and theta notation with suitable example.

8. Convert the following expression in postfix and prefix notation :
   (a) (A+B)*C/D + E^ F/G
   (b) A+ [B*C – (D/E^F)*G]*H

9. Construct the Binary tree using following traversals :
   Pre order : A B D H E C F G
   In-order : D H B E A F C G

10. Explain 'Breath First Search' (BFS) with suitable example and also write an algorithm for 'Breath First Search' (BFS).

11. Explain 'Binary Search' with suitable example and also write an algorithm for Binary Search.

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B.Tech.(Computer Science) SEMESTER-III (WINTER-2019)

BTCS314 PRINCIPLES OF PROGRAMMING LANGUAGES

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Define lexeme and token.
   ii Define orthogonality.
   iii Define binding time.
   iv Differentiate between structure and union in two points.
   v What do you mean by implicit sequence control structure?
   vi What do you mean by declarative programming?
   vii What are abstract data types?
   viii What is information hiding?
   ix Define parallel programming.
   x What is mutex?

PART – B

2. i Explain different programming paradigms with example.
   OR
   ii What is a parse tree? Explain with suitable example.

3. i Explain Arrays and lists.
   OR
   ii Explain type equivalence.

4. i Explain parameter passing mechanism with suitable example.
   OR
   ii Explain exception handling with a suitable example.

5. i Explain stack based storage management.
   OR
   ii Explain garbage collection.

6. i Explain monitors.
   OR
   ii Explain message passing in parallel programming with a suitable example.

PART – C

7. Explain syntax and semantic analysis with a suitable example.
8. Explain the specification and implementation of elementary and structured data types.
9. What are subprograms? How are they defined and called? Write a recursive subprogram to calculate Fibonacci numbers.
10. Explain fixed and variable size heap storage management with suitable example.
11. Explain threads and semaphores with suitable examples.

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B. TECH. (COMPUTER SCIENCE) SEMESTER-III (WINTER-2019)

BTCS315 OBJECT ORIENTED PROGRAMMING

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What is object oriented programming?
   ii Define encapsulation and data hiding with suitable example.
   iii Define reference variable with suitable example.
   iv Give the difference between class and object.
   v What is inline function?
   vi Define constructor with suitable example.
   vii Define inheritance with suitable example.
   viii What is polymorphism?
   ix What do you mean by different file mode parameters?
   x What is function template?

PART – B

2. i Give advantages of object oriented programming.
   OR
   ii Differentiate between 'Functional Programming' and 'Object Oriented Programming'.

3. i Explain the client-server architecture in C++ with suitable example.
   OR
   ii Discuss the memory allocation of objects with suitable example.

4. i Explain operator overloading with suitable example.
   OR
   ii Discuss function overloading with suitable example.

5. i What is virtual function? Explain with suitable example.
   OR
   ii Discuss different types of 'inheritance' with suitable example.

6. i What is template? Describe with suitable example.
   OR
   ii Explain the function seekg( ), seekp( ) and tellg( ) in file handling with suitable example.

PART – C

7. Explain the applications and characteristics of object oriented programming.

8. Discuss the control statement in C++? Explain with suitable example.

9. Explain the 'friend function'. Also write a C++ program to compute the addition and subtraction of complex number using friend function.

10. How we can handle exception handling in C++? Explain with suitable example.

11. Discuss different classes of file stream operation with suitable diagram.

Roll No./रोल न._____

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B.TECH (COMPUTER SCIENCE) SEMESTER-III (WINTER-2019)

BTCS 316 ADVANCED ENGINEERING MATHEMATICS

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Each question carries 10 marks.

PART – A

1. i Define even and odd functions. Give an example of a function which is neither even nor odd.
   ii Define limit and continuity of function of complex variables.
   iii Define mean and variance.
   iv Define two types of errors in the testing of hypothesis.
   v What do you mean by unit step function?
   vi What is periodic function?
   vii Gauss elimination method is used to solve……..
   viii Write the fourth order Runge-Kutta method to solve initial value problems of ordinary differential equation.
   ix Write the formula of Simpson's 3/8 rule.
   x Find Fourier cosine series of $f(x) = 1, 0 \le x \le 2$.

PART – B

2. i Obtain the first three cosine terms and constant term in the Fourier series for y where :-

x	0	1	2	3	4	5
y	4	8	15	7	6	2

   OR

   ii Find inverse z transform of $fz^{-1} = \left[\frac{1}{(z-3)(z-2)}\right]$

   (a) If $|z| < 2$

   (b) If $2 < |z| < 3$

3. i Apply the convolution theorem to obtain $L^{-1}\{\frac{s}{(s^2+a^2)^2}\}$.

   OR

   ii Use Laplace transform technique to solve $(D^2 + 1)x = tcos2t, x(0) = x'(0) = 0$.

4. i Find the Fourier sine transform of $f(x) = e^{-x}, x \ge 0$. Also show that $\int_0^\infty \frac{x\, sinmx}{x^2+1}\, dx = \frac{\pi}{2} e^{-m}, m \ge 0$.

   OR

   ii Find the Fourier cosine and sine transform of $f(x) = \begin{cases} x, & for\ 0 < x \le 1 \\ 2-x, & for\ 1 < x < 2 \\ 0, & for\ x \ge 2 \end{cases}$

5. i Find the Fourier series expansion of the following periodic function with period 2π

   $f(x) = \begin{cases} \pi + x, & -\pi < x < 0 \\ 0, & 0 \le x \le \pi \end{cases}$

   OR

   ii Solve $(D^2 - D'^2 - 3D + 3D')z = xy + e^{x+2y}$.

6. i Use Euler's modified method with one step to obtain the value of y at $x = 0.1$ when $\frac{dy}{dx} = x^2 + y$ with $x = 0, y = 0.94$.

   OR

   ii Apply Picard's method to find the solution of differential equation $\frac{dy}{dx} = y - x$ with $x = 0, y = 2$ upto 3rd order of approximation.

PART – C

7. A slider machine moves along a fixed straight rod. Its distance x cm along the rod is given below for various values of time '*f*' seconds. Find the velocity of the slider and its acceleration when t = 0.3 seconds

f:	0	0.1	0.2	0.3	0.4	0.5	0.6
x:	36.13	31.62	32.87	33.64	33.95	33.81	33.24

8. Compute the values of $\int_0^6 \frac{dx}{1+x^2}$ by the:

i Trapezoidal rule
ii Simpson's 1/3 rule
iii Simpson's 3/8 rule

And compare your results with the exact value of integration.

9. Compute $U_{12.2}$ from the following data:

x:	10	11	12	13	14
$10^5\mu_x$*:*	23967	28060	31788	35209	38368

State the formula used and why?

10. Find the extremum point function $u = x^2 + 4y^2 + 4z^2 + 4xy + 4xz + 16yz$.

11. Use Euler's method to solve: $\frac{dy}{dx} = \frac{y^2-2x}{y^2+x}$ given $y = 1$ at $x = 0$. Find y for $x = 0.1, 0.2, 0.3, 0.4$.

Roll No./_____

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B.TECH. (COMPUTER SCIENCE) SEMESTER-IV (SUMMER-2018)

BTCS411 LINUX AND SHELL PROGRAMMING

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Define hard and symbolic links.

   ii What is open source?

   iii What is system call?

   iv What is vim?

   v What is xinitrc file?

   vi What is shell? How do you customize x-work environment?

   vii Explain any two special characters for searching files?

   viii What is NULL variable?

   ix What are builtins?

   x What is open source?

PART – B

2. i Explain following basic shell commands with example
   (i) ls (ii) grep (iii)diff
   OR
   ii Explain following basic shell commands with example
   (i) man (ii) who (iii)date

3. i Explain yank,put and delete commands.
   OR
   ii Explain vi editor and its modes.

4. i What is window manager and how do you customize the *fvwm* window manager.
   OR
   ii Explain remote computing and local displays.

5. i Write a shell script to add two numbers input through command line.
OR
ii Explain Bourne Again Shell in detail.

6. i Explain
(i) Job Control (ii) *Here* document
OR
ii Explain Source code management.

PART – C

7. Explain access permissions. Also explain how to change access permissions for files and directories.

8. Explain the following : (4+3+3)
i) Compiling and debugging a C program
ii) make utility
iii) debugging using gdb

9. What is X-window system? Explain x-window as a client server system.

10. Explain I/O redirection and pipes with example. Also explain any two filters.

11. Explain control structures used in shell programming in detail with example. Write a shell script to print first 10 odd numbers using while loop.

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प्रश्नपत्र पर क्रमांक (रोल नम्बर) के अतिरिक्त कुछ भी लिखना अनुचित साधनों का प्रयोग माना जायेगा तथा नियमानुसार कार्यवाही की जायेगी।

B. TECH. (COMPUTER SCIENCE) SEMESTER-IV(SUMMER-2018)

BTCS412 MICROPROCESSOR AND INTERFACES

Time – Three Hours Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What are the differences between a calculator and a computer?

   ii Name various components of a microprocessor.

   iii Explain the term addressing modes.

   iv Distinguish between main memory and secondary memory.

   v How many memory locations 8085 can address?

   vi What is the role of "counter" in a microprocessor?

   vii How is the timer used in a microcontroller?

   viii Give names of various data transfer schemes.

   ix What is the need of I/O ports in a microcomputer system?

   x What is the need of DMA?

PART – B

2. i Give an overview of the evolution of computer languages? Highlight the merits and demerits of each type of language.
   OR
   ii Differentiate between microprocessor, microcontroller and microcomputer.

3. i Briefly explain the evolution of microprocessors.
   OR
   ii Explain Bus concept used in microprocessor system using suitable diagram.

4. i How many different instructions are implemented in 8085?
   OR
   ii What are sub routines? Explain the role subroutine in managing various operations of micro-operations.

5. i Explain the working term clock cycle (T State), machine cycle and instruction cycle.
   OR
   ii How is memory interfacing done for micro controller devices? Discuss the working using suitable example.

6. i Provide a brief overview of the working of USART 8251.
   OR
   ii With the help of a neat diagram, explain the architecture of 8255 Programmable Peripheral Interface Chip.

PART – C

7. List the steps needed for executing an 8085 assembly language program using simple example.

8. Enlist architectural differences between 8086 and 8088 microcontroller.
9. Write a program in assembly language to perform addition of two 8 bit numbers for 8085 microcontroller.

10. Explain using syntax about any five instruction codes used in 8085 assembly programming. Also give example for each.

11. Explain DMA technique and its architecture for 8257 controller.

Roll No./_____

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B. TECH. (COMPUTER SCIENCE) SEMESTER-IV (SUMMER-2018)

BTCS413 JAVA PROCESSING

Time – Three Hours Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What do you understand by OOP?

   ii What is JVM?

   iii How ID array is declared, constructed and initialized in Java?

   iv What do you understand by garbage collection?

   v What do you mean by super keyword?

   vi What is access control in Java?

   vii Write different types of inheritance available in Java.

   viii What is a Java Applet?

   ix What is a Java string?

   x What do you mean by stream classes?

PART – B

2. i Explain features of Java in detail.
   OR
   ii What is Java virtual machine? Explain how byte code is different from executable code?

3. i Explain different type of operators available in Java with example.
   OR
   ii Write a Java program to print factorial of a number.

4. i What is package? How it is implemented in Java.
   OR
   ii Explain different types of inheritance in Java with examples.

5. i Discuss differences between Applet and Application.
   OR
   ii Explain the life cycle of Applet with diagram.

6. i Discuss special string operation with suitable example.
   OR
   ii Explain different 'output stream' methods with description.

PART – C

7. What is polymorphism? How it is implemented in Java? Explain with example.

8. Explain method overloading with suitable example.

9. Write short notes on:
   (a) Method overriding
   (b) Abstract classes

10. Explain drawing polygons in detail with examples.

11. Discuss different string searching and comparison function with suitable examples.

Roll No./रोल न._____

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B.TECH. (COMPUTER SCIENCE) SEMESTER-IV (SUMMER-2018)

BTCS414 COMPUTER ARCHITECTURE

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What do you mean by bus

   ii What is a register

   iii What is instruction format

   iv What is instruction pipeline

   v Differentiate between signed and unsigned numbers

   vi What is 1's complement

   vii What is micro programmed controller

   viii What is hard wired control

   ix What is RAM

   x What is a strobe

PART – B

2. i Explain arithmetic micro operations
   OR
   ii Explain commonly used registers and types of micro operations

3. i Explain interrupts and it's types
   OR
   ii Explain different addressing modes

4. i Explain array multiplier with example
   OR
   ii Explain Booth's algorithm

5. i Explain horizontal and vertical formats
OR
ii Explain address sequencer

6. i Explain vertical memory organization
OR
ii Explain associative n cache memory in brief

PART – C

7. Explain data movement from/to memory in detail with help of a suitable neat labeled diagram

8. Explain CPU organization with large registers

9. Explain addition for signed unsigned numbers and 2's complement numbers using example

10. Explain basic organization of a micro programmed controller

11. Explain
a) DMA based data transfer
b) I/O processor

Roll No./ _____

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B.TECH. (COMPUTER SCIENCE) SEMESTER-IV (SUMMER-2018)

BTCS415 PRINCIPLES OF COMMUNICATION

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What is DSBSC.

   ii Define modulation and demodulation

   iii Write down sampling theorem .

   iv What is aliasing? How can it be prevented?

   v Show how companding reduces the quantization error?

   vi Write short note on delta modulation transmitter.

   vii What is PSK?

   viii Write short note on primary causes of inter symbol interference.

   ix Write down any two spread spectrum system.

   x What is CDMA?

PART – B

2. i State advantages of SSB over DSB. Explain any one method to generate SSB.
   OR
   ii With the help of neat block diagram explain the principle and generation of indirect method of FM generation.

3. i With the help of neat circuit diagram explain the generation of Pulse Position Modulation signal
   OR
   ii A bandpass signal has a spectral range that extends from 20 to 82 **kHz.** Find the acceptable range of the sampling frequency f_s.

4. i With the neat block diagram explain the working of adaptive delta modulation.
   OR
   ii Explain error probability in PCM system.

5. i Draw following data wave forms for bit stream 110101101
(a) Bipolar RZ (b) Unipolar NRZ
OR
ii Distinguish between baseband and pass band transmission.

6. i Distinguish between baseband and pass band transmission.
OR
ii Distinguish between DSSS and FHSS.

PART – C

7. Define FM and derive equation of FM wave.

8. Explain generation and demodulation of PAM signal with the help of diagram.

9. Draw and explain delta modulation transmitter and receiver. What is meant by slope overload distortion.

10. Explain following in detail
(a) ASK (b) FSK (c) QPSK (d) MSK

11. What is spread spectrum modulation . Explain its application in detail.

Roll No./रोल न._____

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प्रश्नपत्र पर क्रमांक (रोल नम्बर) के अतिरिक्त कुछ भी लिखना अनुचित साधनों का प्रयोग माना जायेगा तथा नियमानुसार कार्यवाही की जायेगी।

B. TECH. (COMPUTER SCIENCE) SEMESTER-IV (SUMMER-2018)

BTCS416 DISCRETE MATHEMATICAL STRUCTURES

Time – Three Hours Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Show that $R \vee \bar{R}$ is a tautology.

   ii How would you define a simple graph mathematically?

   iii Prove that **P** logically implies $Q \rightarrow P$.

   iv State the principle of mathematical induction.

   v How do we denote a 'sub-set' and 'super-set' mathematically?

   vi Explain the importance of Venn diagram?

   vii How will you define degree of a vertex?

   viii Define equivalence relation.

   ix State the essential difference between permutation and combination with examples.

   x Give use of bipartite graph.

PART – B

2. i We define the following on the universe of men.
   M (x): x is mortal
   C (x): x lives in the city
   Symbolize the negations of the following propositions changing the quantifier:
   (a) All men are immortal
   (b) Some men live in the city

   OR

   ii Consider the prepositions:
   p: Max is sulking
   q: Today is my birthday
   Write in words the compound propositions given by:
   (a) $p \wedge q$
   (b) $p \rightarrow q$
   (c) $q \leftrightarrow p$

3. i Prove that $2n > n$ for all positive integers n.

   OR

   ii Prove that the sum of two consecutive integers is odd.

4. i What is a walk in graph? Define the term isomorphism for directed graphs using suitable example.

   OR

   ii State special conditions for a graph to be Eulerian and Hamiltonian. Also give related examples to support your answer.

5. i What do you understand by cardinality of a set? Using suitable examples, explain the operation of performing difference among sets.

OR

ii Of 120 students, 120 are studying French, 50 are studying Spanish and 20 are studying both French and Spanish. A student is chosen at random. Find the probability that the student is studying:

(a) French or Spanish
(b) Neither French or Spanish
(c) Only French
(d) Exactly one of the two languages

6. i Show that every Abelian group is not cyclic.

OR

ii Differentiate between homomorphism and isomorphism.

PART – C

7. Explain various symbolic representations used as mathematical tool for expressing logical problems of real world? Give relevant examples in support of your answer.

8. What are the various techniques of theorem proving? Determine which of the following sets are finite:

(a) Lines parallel to the x-axis
(b) Integers which are multiples of 5
(c) Letters in the English alphabet
(d) Animals living on the earth

9. "Graph planarity is an inherent property of a graph". What do you understand by planar and non-planar graph? Contrast the significance of implementation in computing systems.

10. Explain the following terms (**ANY TWO**):

(a) Kuratowski's theorem
(b) Flows and cuts
(c) The Pigeonhole principle
(d) Max-flow min-cut theorem

11. "A monoid is an algebraic structure with a single associative binary operation and an identity element". Explain various monoid structures using suitable example.

Roll No./_____

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B.Tech.(COMPUTER SCIENCE) Semester-V (WINTER-2018)

BTCS511 SOFTWARE ENGINEERING

Time – Three Hours Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question.. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Each question carries 10 marks.

PART – A

1.

i Define software engineering.

ii Name two problems in systems development.

iii What are the objectives of software project management?

iv What is risk analysis?

v What is a prototype?

vi What is SRS?

vii Differentiate between coupling and cohesion.

viii What is object oriented architecture?

ix List two advantages of object oriented design.

x Differentiate between class and object.

PART – B

2. i Explain system and its characteristics.
OR
ii Explain how to model the system architecture and give system specifications.

3. i Explain spiral model.
OR
ii Explain LOC and FP estimation.

4. i Explain finite state machine (FSM) models.
OR
ii Explain requirements analysis and what are its principles?

5. i Explain design fundamentals.
OR
ii Explain design documentation giving example.

6. i Explain in brief:
   a) Data modeling
   b) b) Object modularization

OR

ii What is Unified Modeling Language? Explain.

PART – C

7. Explain System Development Life Cycle (SDLC) in detail.

8. Explain COCOMO estimation model.

9. Explain tools used for structured analysis.

10. Explain architectural and procedural design.

11. What is object oriented design? Explain its concepts and define class and object relationships.

Roll No./_____

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B. Tech. (COMPUTER SCIENCE) Semester-V (WINTER-2018)
BTCS512 ADVANCED JAVA

Time – Three Hours Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question.. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Each question carries 10 marks.

PART – A

1. i What is HTML tags ?
   ii What is 'Swing'?
   iii What is delegation model?
   iv Give the difference between multitasking and multithreading.
   v Give the advantages of Servlet?
   vi What is common gateway interface ?
   vii What is JDBC?
   viii Give the advantage of driver manager class.
   ix What is JSP?
   x What is the difference between hide comment and output comment?

PART – B

2. i Explain the 'Multiple Catch' statements in exception handling with suitable example.
   OR
   ii Explain the concept of inner and outer class in java with example.

3. i Explain the multithreading using thread class with suitable example.
   OR
   ii Explain the event listener interface.

4. i Explain ser/let response interface.
   OR
   ii What is Servlet? Also explain the life cycle of servlet with suitable diagram.

5. i What are the steps to connect to the database in java?
   OR
   ii Write a program in java which stores the data in data base using JDBC.

6. i Explain the JSP directives.
   OR
   ii What is the difference include directive and include action

PART – C

7. Give the difference between Swing and AWT. Also explain different Layouts in swing with suitable diagram.

8. Explain the concept of 'Synchronization' in multithreading with suitable example.

9. Explain the architecture of J2EE with suitable diagram in detail

10. Explain the JDBC drivers with suitable diagram

11. Explain the JSP architecture and processing with suitable diagram

Roll No./_____

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B. Tech. (COMPUTER SCIENCE) Semester-V (WINTER-2018)
BTCS513 DATABASE MANAGEMENT SYSTEM

Time – Three Hours | Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question.. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Each question carries 10 marks.

PART – A

1. i What is inconsistency?

   ii Write any two drawbacks of file processing system.

   iii Define composite attribute.

   iv What are constraints?

   v Why do we need relational database?

   vi What is domain?

   vii Write basic form of SQL queries.

   viii What is the significance of NULL in SQL?

   ix What is normalization?

   x What is schema refinement?

PART – B

2. i What is abstraction? Explain different levels of abstraction.
   OR
   ii What are access anomalies in file processing system? How it can be controlled in DBMS?

3. i Draw an E-R diagram for library management system with all its components.
   OR
   ii What is aggregation? Explain with help of suitable example.

4. i Explain domain relational calculus with suitable example.
   OR
   ii Explain tuple relational calculus with suitable example.

5. i Explain following aggregate functions with suitable example:
   a. STDDEV
   b. VARIANCE
   c. AVG
   d. COUNT
   OR
   ii Explain following commands:
   a. Alter table
   b. TRUNCATE
   c. COMMENT
   d. UPDATE

6. i Explain different types of functional dependencies.

OR

ii What is INF? Explain how we can get it.

PART – C

7. What is DBA? Explain different tasks of DBA.

8. What is E-R diagram? Explain different symbols of E-R diagram. Also discuss different keys used.

9. Explain different operations of relational algebra with suitable example.

10. Explain triggers. Describe how they are created and used?

11. What is normalization? Explain different forms of normalization.

Roll No./_____

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B. Tech. (COMPUTER SCIENCE) Semester-V (WINTER-2018)
BTCS514 COMPUTER GRAPHICS & MULTIMEDIA

Time – Three Hours | Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question.. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Each question carries 10 marks.

PART – A

1. i What is computer graphic? Write its two characteristics.

   ii What is homogenous coordinates?

   iii What is world coordinate system?

   iv How will you present 3D object on 2D screen?

   v What is point clipping?

   vi What is phong shading?

   vii What is multimedia?

   viii How multimedia is useful in business and work?

   ix What do you mean by video conferencing?

   x What is zig-zag coding?

PART – B

2. i Explain raster scan display with diagram.
   OR
   ii Explain symmetric DDA with example.

3. i Explain composite transformation with example.
   OR
   ii Explain parallel and perspective projection in detail

4. i Explain polygon clipping algorithm with example.
   OR
   ii Explain various color models in detail.

5. i Explain computer based animation and H261 in detail.
   OR
   ii Explain multimedia and objects in detail.

6. i Explain in detail how you will compress JPEG file?
   OR
   ii Explain inter and intra object synchronization in detail.

PART – C

7. Explain Bresenham's algorithm and Bezier method in detail.

8. Explain 2D and 3D coordinate system in detail.

9. Explain illumination model in detail.

10. Explain multimedia building block with example.

11. Explain line and synthetic synchronization in detail.

Roll No./_____

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B. Tech. (COMPUTER SCIENCE) Semester-V (WINTER-2018)

BTCS515 SYSTEM SOFTWARE ENGINEERING

Time – Three Hours Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question.. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Each question carries 10 marks.

PART – A

1. i What is an object code?

   ii What are addressing modes?

   iii What is assembler?

   iv What is register?

   v What do you understand by bootstrap?

   vi What is loader?

   vii What is macro?

   viii What do you understand by label?

   ix What do you understand by symbol table?

   x What do you understand by expression?

PART – B

2. i How assembly language is different from machine language? Give example and explain.
   OR
   ii What do you understand by system software? Explain.

3. i Explain the different features of assemblers.
   OR
   ii What do you understand by pars structures of assemblers?

4. i Explain the design of linker.
   OR
   ii Explain the difference between absolute and relocatable loader with the help of suitable example.

5. i What do you understand by macro definition? Give example.
   OR
   ii What do you understand by micro-processors? Explain.

6. i What do you understand by token? Give example and explain.
   OR
   ii What do you understand by parsing? Explain.

PART – C

7. Explain the concept of data allocation with the help of an example.

8. Explain the different classifications of assemblers.

9. Explain the different features of loader with the help of suitable example.

10. Explain the design of micro-processors with the help of suitable diagram.

11. What do you understand by symbol table management? Give example and explain.

Roll No./ _____

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B. Tech. (COMPUTER SCIENCE) Semester-V (WINTER-2018)
BTCS516 ADVANCED DATA STRUCTURE

Time – Three Hours | Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question.. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Each question carries 10 marks.

PART – A

1. i What is BPS?

   ii Define dictionary and dictionary with duplicates.

   iii What do you mean by sorting network?

   iv Define Zero One Principle.

   v What are planner and non planner graphs?

   vi Define dual graphs.

   vii What do you mean by spanning tree?

   viii What is meant by GCD with recursion method?

   ix Define integer factorization.

   x Define Red Black Tree.

PART – B

2. i Explain Red- Black Tree Deletion Algorithm with appropriate example.
   OR
   ii Explain various types of Splay Tree operations with suitable example of each.

3. i Explain Bitonic Sorting And Merging Network Sorter with suitable example.
   OR
   ii Explain Fibonacci Heap and implementation of Fibonacci Heap.

4. i Explain Cut-Set And Cut-Vertices planer with example.
   OR
   ii Explain Isomorphic and Homomorphic Graphs in graph theory.

5. i Explain algorithm for Connectedness with the help of example.
   OR
   ii Explain the Ford Fulkerson Max Flow Algorithm with suitable example.

6. i State and prove Chinese Remainder Theorem with example.
   OR
   ii What do you mean by Modular Arithmetic? Explain with example.

PART – C

7. Explain Insertion Algorithm in Red-Black Tree with appropriate example.

8. Explain representation of 2-3-4 Trees and also explain insertion operation in 2-3-4 Tree.

9. Explain and draw various types of graphs with their properties.

10. Explain Max-flow Min-cut Theorem with appropriate example.

11. Explain RSA algorithm (with p = 17 and q = l 1 and M = 88). Find Public Key Set, Private Key Set, Encrypted Text and Final Decrypted Text.

Roll No./_____

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B.TECH. (COMPUTER SCIENCE) SEMESTER-VI (SUMMER-2019)

BTCS611 .NET TECHNOLOGIES

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What are Assemblies?

   ii What is MSIL?

   iii Explain Select-Case statement in VB.NET with suitable example.

   iv Explain 2 D array in VB.NET with suitable example.

   v What is the purpose of a progress bar control in VB.NET?

   vi What is List Box?

   vii What is Data Set?

   viii What is ODBC?

   ix What is Page life cycle in ASP.NET?

   x What is ASP.NET?

PART – B

2. i Explain the .NET frame work design principle.
   OR
   ii Write short note on 'Visual Studio .net IDE'.

3. i Describe the following statements in VB.NET with suitable examples.
   a) While..End
   b) If..Else Statement
   OR
   ii What is the role of 'Option' statements in VB.NET?

4. i Write short note on 'Multiple Document Interface (MDI) in VB.NET.
   OR
   ii Explain Inheritance in VB.NET with suitable example.

5. i Explain the ADO.NET architecture in detail with suitable diagram.
   OR
   ii Write steps to connect database with VB.NET with suitable example.

6. i Explain the ASP.NET life cycle in detail.
OR
ii Explain 'Base Validator' class and 'Range Validator' class in ASP.NET.

PART – C

7. Explain the '.NET Frame Work' architecture with suitable diagram in detail.

8. Explain Exception handling in VB.NET with suitable example.

9. Write a program in VB.NET which creates calculator that performs addition, subtraction, multiply and division operations.

10. Write short notes on following:
a).OLEDB Connection
b) .OLEDB Command
c) .OLEDB Data Reader
d) .OLEDB Data Adapter

11. Explain the ASP.NET web form features in detail.

Roll No./_____

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B.TECH. (COMPUTER SCIENCE) SEMESTER-VI (SUMMER-2019)

BTCS612 COMPUTER NETWORKS

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Define WAN.
   ii Define Intranet?
   iii What is CRC?
   iv What is HDLC?
   v What do you mean by IPV6?
   vi What is IP Address?
   vii What is Telnet?
   viii What is Transport Layer?
   ix Define HTTP?
   x What is E-mail?

PART – B

2. i Differentiate internet, intranet and extranet.
   OR
   ii Explain transmission media.

3. i Describe in detail about Hamming code.
   OR
   ii Discuss briefly about the MAC layers in the 802.3 standard.

4. i Describe in detail about the link state routing algorithm.
   OR
   ii Write short notes on :
   a) Packet Switching
   b) Circuit Switching

5. i What is multiplexing? Explain the basic format of multiplexed system.
   OR
   ii Explain in detail about the efficiency and delay in Datagram Networks.

6. i What are the protocols provided by application layer? Explain.

OR

ii What are the different request types available in HTTP? Explain.

PART – C

7. What are the different layers in the OSI reference model? Explain the functionalities of each layer.

8. What is data link layer? Briefly discuss each of the following terms:
a)Framing
b) Error Control
c) Flow Control
d) Aloha

9. What is IP protocol? Discuss briefly about IPV4 and IPV6 with the necessary diagrams.

10. Discuss briefly about connectionless and connection oriented transport in transport layer.

11. Briefly discuss about each of the following terms:
a)WWW
b) MIME
c) SMTP
d) DNS

Roll No./_____

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B.TECH.(COMPUTER SCIENCE) SEMESTER-VI (SUMMER-2019)
BTCS613 DESIGN AND ANALYSIS OF ALGORITHMS

Time – Three Hours Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART-A

1. i What do you understand by notation?

   ii What is spanning tree? Give example.

   iii Explain matrix chain multiplication.

   iv Define N Queen problem.

   v What is Rabin-Karp?

   vi What do you understand by Knuth Morris Pratt?

   vii What is flowship scheduling?

   viii What do you understand by min-cut?

   ix What are P and NP class?

   x Define vertex cover problem.

PART-B

2. i Explain merge sort. How it is different from quick sort?
   OR
   ii What do you understand by optimal pattern merge? Give suitable example and write its algorithm.

3. i Explain longest common subsequence with suitable example
   OR
   ii What is 0-1Knapsack problem? Explain with example.

4. i Explain string matching algorithm. Explain how Rabin Karp hashing is different from Knuth Morris Pratt algorithm.
   OR
   ii Explain Bayer-Moore algorithm in detail.

5. i Explain difference between Las Vegas and Monte Carlo algorithm.
   OR
   ii What is randomized algorithm? Explain min-cut and 2-SAT

6. i What is NP hard? Explain difference between NP complete and NP hard.
   OR
   ii Explain Cook's theorem.

PART-C

7. What do you understand by divide and conquer? Explain binary search algorithm with suitable example.

8. What is traveling salesmen problem? Explain in detail.

9. Explain assignment problem with its different applications.

10. Write short note on network capacity assignment problems and multi commodity flow.

11. What do you understand by approximation algorithm? Explain in detail with example.

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B.TECH. (COMPUTER SCIENCE) SEMESTER-VI (SUMMER-2019)

BTCS614 EMBEDDED SYSTEMS

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What is Embedded System?

   ii What are Handheld devices?

   iii Name any two embedded operating system.

   iv What is Harvard Architecture?

   v What is microprocessor?

   vi What is micro controller?

   vii Explain arithmetic instruction of 8051 micro controller.

   viii Explain branching instruction of 8051 micro controller.

   ix What is USB?

   x Explain LCD Interface in 8051 micro controller.

PART – B

2. i What are challenges and issues in Embedded Software development?
   OR
   ii What are requirements of Embedded System?

3. i Explain 8051 Microcontroller architecture.
   OR
   ii Explain Embedded System development process.

4. i Differentiate between microprocessor and microcontroller.
   OR
   ii Differentiate between 8 bit, 16 bit and 32 bit micro controller.

5. i Explain logical instructions and data transfer instructions in 8051 micro controller.
   OR
   ii Explain byte level and bit level instructions.

6. i Explain serial and parallel I/O interfacing in 8051 microcontroller.
OR
ii Explain keyboard interfacing in 8051 microcontroller.

PART – C

7. What is Embedded System? Explain different types of Embedded Systems. Also explain application of embedded systems in Biomedical systems.

8. What are embedded operating systems? Explain different types of embedded operating systems.

9. Explain 8051 microcontroller with pin diagram.

10. Explain different types of addressing modes supported by 8051 micro controller with example of each.

11. Explain Memory Interface and Stepper Motor Interface of 8051 microcontroller.

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B.TECH. (COMPUTER SCIENCE) SEMESTER-VI (SUMMER-2019)
BTCS615 THEORY OF COMPUTATION

Time – Three Hours | Maximum Marks – 80

Note:
1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What is an automaton?
   ii How will you define a regular set?
   iii Give an example of derivation tree?
   iv Give structure of grammar using tuples.
   v What do you mean by pumping lemma for regular sets?
   vi What is Chomsky normal form?
   vii What do you mean by terminal and non terminal symbol?
   viii What are the conditions for a set to be categorized as recursively enumerable?
   ix Give various applications of Linear Bounded Automata?
   x What is Non-Deterministic Push Down Automata (NDPDA)?

PART – B

2. i Grammar G, S-> 0B |1A, A->0|0S|1AA, B-> 1|1S|0BB. Find the leftmost and rightmost derivative.
   OR
   ii Define a Non Deterministic Finite automation using help of a graph.

3. i Discuss Closure properties of regular sets using suitable example.
   OR
   ii Draw graph that is represented by below regular expressions:
   (a) (a+b)*(aa+bb+ab+ba)*
   (b) (aa)* + (aaa)*

4. i Explain the concept of Derivation Tree used in Context Free Grammars. What is ambiguity? Use suitable example in support of your answer.
   OR
   ii Construct a Grammar in Greibach Normal Form.
   For the string: 00110101 find the:
   (a) Leftmost derivation
   (b) Rightmost derivation

5. i Explain Turing Machine Model using suitable diagram.
   OR
   ii Enumerate properties of recursive and recursively enumerable languages.

6. i Explain tuple set used for Linear Bounded Automata.
   OR
   ii Discuss additional production rules for the LBA's generative grammar construction.

PART – C

7. Show the equivalence of DFA and NDFA.

8. Construct a Deterministic Finite Automata for a set of all strings over {0, 1} whose length is divisible by 7.

9. What is a pushdown automata? Discuss two types of sets by pushdown automata.

10. Discuss halting problem in Turing Machine? Also explain construction of Multi-tape and Multi Track Turing Machine.

11. Discuss the relation between languages and types of automata with help of diagram.

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B.TECH. (COMPUTER SCIENCE) SEMESTER-VI (SUMMER-2019)

BTCS616 OPERATING SYSTEMS

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What is a system call?

   ii Differentiate between preemptive and non preemptive scheduling.

   iii What do you mean by interprocess communication?

   iv What is a semaphore?

   v Differentiate between contiguous and non contiguous memory allocation.

   vi What is segmentation?

   vii What is a page fault?

   viii What is virtual memory?

   ix What is a directory system?

   x Name two file access methods.

PART – B

2. i Explain First Come First Serve (FCFS) and Round Robin Scheduling algorithms with help of suitable example.
   OR
   ii What is I/O buffering?

3. i Explain critical section problem.
   OR
   ii Explain any one classical problem of synchronization.

4. i Explain logical and physical address space.
   OR
   ii Explain paging.

5. i What is thrashing? What measures can be taken to avoid thrashing?
   OR
   ii What is demand paging? Also explain its advantages and disadvantages?

6. i Write notes on distributed system and parallel processing.
OR
ii Explain file allocation methods.

PART – C

7. Explain operating system, its services and its types.

8. Explain deadlock handling mechanism in detail.

9. Explain paging combined with segmentation.

10. Explain Lest Recently Used(LRU) and First In First Out(FIFO) page replacement algorithm with help of following reference.
Page reference string: 7,0,1,2,0,3,0,4,2,3,0,3,2

11. What is Disk scheduling? Explain SCAN and C-Look algorithms.

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B. Tech. (COMPUTER SCIENCE) SEMESTER-VII (WINTER-2019)

BTCS711 COMPILER CONSTRUCTION

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What is Translator?

   ii What is Single pass and Multi [ass compiler?

   iii What is Top Down Parsing?

   iv What do you mean by context free grammar?

   v What is Syntax Tree?

   vi What is three address code?

   vii What is a symbol table?

   viii What is an Activation record?

   ix What is global data flow analysis?

   x What do you mean by code optimization?

PART – B

2. i Write a short note on "Input Buffering".
   OR
   ii What is "Boot strapping"? Explain with suitable example.

3. i What do you mean by ambiguity of grammar? Explain with example.
   OR
   ii Give the model of the predictive parser. Explain each action of predictive parser.

4. i Define syntax directed definition. Explain the various forms of syntax directed definition.
   OR
   ii What is the process and the importance of intermediate code generation.

5. i What are the different data structures used for symbol table organization? Which data structure provides best performance and why?
   OR
   ii Discuss various parameters passing mechanism for procedure call.

6. i Explain the DAG representation of basic blocks with suitable example.
   OR
   ii Discuss the different issues in the design of code generator.

PART – C

7. Explain the different phases of compiler design with the help of suitable example.

8. What do you mean by left recursion? How do we eliminate left recursion? Eliminate left recursion from the following grammar :
E→E+T |T
T→T*F |F
F→(E)|id

9. Explain the meaning of quadruples, triples and indirect triples. Translate the expression (a+b)*(c+b)*(a+c) into quadruples, triples and indirect triples.

10. Explain accessing of local and non local names in block structured language in details.

11. What do you mean by peephole optimization? Explain in detail.

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B. TECH. (COMPUTER SCIENCE) SEMESTER-VII (WINTER-2019)

BTCS712 DATA MINING AND WAREHOUSING

Time – Three Hours | Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either (**A**) **or (B)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What is data mining?
   ii What is clustering?
   iii What is data warehousing?
   iv What is Neural Network?
   v What is OLAP?
   vi What is MOLAP?
   vii What is fact constellation?
   viii What is CURE?
   ix What do you mean by 3-tier architecture?
   x What is data marting?

PART – B

2. i What is data and data preprocessing? Explain data integration and transformation in detail.
   OR
   ii Discuss in detail about data mining and data warehousing?

3. i What is Data generalization? Explain in detail.
   OR
   ii Explain different association rules of RDBMS.

4. i Explain K- nearest neighbor clustering method with proper example.
   OR
   ii Explain DBSCAN and OPTICS.

5. i Differentiate between data base system and data warehouse.
   OR
   ii Explain different data processing models.

6. i What do you mean by aggregation? Explain different aggregation methods in data mining and warehousing
   OR
   ii Explain the concept of tuning data warehouse and testing data warehouse.

PART – C

7. What is Data Reduction? Explain dimensionality reduction in detail.

8. Explain multidimensional models in detail with example.

9. Explain various categories of clustering methods.

10. Explain the architecture of data warehousing

11. Explain OLAP servers along with OLAP functions and tools in detail.

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प्रश्नपत्र पर क्रमांक (रोल नम्बर) के अतिरिक्त कुछ भी लिखना अनुचित साधनों का प्रयोग माना जायेगा तथा नियमानुसार कार्यवाही की जायेगी |

B. TECH. (COMPUTER SCIENCE) SEMESTER-VII (WINTER-2019)

BTCS713 PHP PROGRAMMING

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What do you mean by MySQL SERVER?

   ii Define constant in PHP.

   iii What is foreach?

   iv Define string.

   v What do you mean by function?

   vi Define associative array.

   vii What is fwrite ( )?

   viii What do you mean by files mode?

   ix What is MySQL?

   x What do you mean by DML?

PART – B

2. What is super global variable in PHP? Explain with example.
   OR
   ii How to file upload? Explain with example.

3. i Explain the following with example:
   (a) for
   (b) foreach
   OR
   ii Write a PHP script to check vowel and consonant using switch statement.

4. i Define function. Explain call by value and call by reference.
   OR
   ii What is array? Explain indexed based array with example.

5. i How to open, write and close a text file in PHP? Explain.
   OR
   ii How to open, create and close a directory in PHP? Explain.

6. i What is RDBMS? Explain DDL and DML.
   OR
   ii How many data types are in MySQL? Give example.

PART – C

7. What are various operators available in PHP? Explain with example.

8. How to create and access string? Explain any four string functions.

9. What is recursion? Write a PHP script to find the factorial of a number using recursion.

10. What is difference between session and cookie? Explain with example.

11. Give syntax and example of following SQL command:
    i INSERT
    ii UPDATE
    iii SELECT
    iv DELETE

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B.Tech (COMPUTER SCIENCE) SEMESTER-VII (WINTER-2019)

BTCS714 ARTIFICIAL INTELLIGENCE

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Define artificial intelligence.
   ii What is hill climbing?
   iii Name two problems faced in representing knowledge.
   iv What is refutation?
   v What is a frame?
   vi What is a semantic network?
   vii What is alpha beta cut off?
   viii What is lexical ambiguity?
   ix What is reasoning?
   x What do you mean by reinforced learning?

PART – B

2. i Explain characteristics and various types of production systems.
   OR
   ii Explain AO* algorithm.

3. i Explain theorem proving and inferencing.
   OR
   ii Explain monotonic and non monotonic reasoning.

4. i Explain Baye's theorem.
   OR
   ii Explain conceptual dependency and fuzzy logic.

5. i Explain steps in natural language processing.
   OR
   ii Explain block world problem in robotics.

6. i What are neural networks and how do they work?
   OR
   ii What are expert systems? Give three examples.

PART – C

7. Explain and compare breadth first search and depth first search with suitable example.

8. Explain knowledge representation using propositional and predicate logic.

9. Explain forward and backward reasoning with suitable example.

10. Explain different game playing techniques.

11. Explain various techniques used in learning.

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B. TECH. (COMPUTER SCIENCE) SEMESTER-VII (WINTER-2019)

BTCS715 CLOUD COMPUTING

Time – Three Hours | Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i What is cloud in cloud computing?
   ii What do you understand by ubiquitous cloud?
   iii List the names of different types of clouds.
   iv What is goggle app engine?
   v What do you understand by virtualization?
   vi List the names of any five I/O devices.
   vii What is SLA?
   viii What are threats in cloud?
   ix What is CRM?
   x What do you understand by social networking?

PART – B

2. i Discuss the historical development of cloud computing with the help of suitable example.
   OR
   ii What do you understand by internet of things? Give example and explain.

3. i What do you understand by map reduce? Give example.
   OR
   ii Explain the concept of parallel and distributed programming.

4. i Explain the different benefits of virtualization technology.
   OR
   ii What do you understand by virtual cluster? Explain by giving examples.

5. i Discuss the different legal issues in cloud computing.
   OR
   ii What do you understand by risk mitigation? Give example and explain.

6. i What do you understand by third party cloud services? Discuss with the help of example.
   OR
   ii Explain the mechanism of satellite usage processing with the help of an example.

PART – C

7. Explain the different components and characteristics of cloud computing.

8. Discuss the use of Hadoop in cloud computing.

9. Explain the implementation level of virtualization with the help of an example.

10. What do you understand by disaster recovery? Give example and discuss.

11. How public clouds are different from private clouds? Explain with example.

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B.TECH COMPUTER SCIENCE SEMESTER-VII (WINTER-2019)

BTCS716 REAL TIME SYTEMS

Time – Three Hours Maximum Marks – 80

Note:

1. All questions are compulsory in Part A. The answers of these questions are limited upto 30 words each. Each question carries 2 marks.
2. Attempt FIVE questions in all from Part B, selecting ONE question either **(i) or (ii)** from each question. Answer of each question shall be limited upto 250 words. Each question carries 6 marks.
3. Attempt 3 questions in all from Part C. Answer of each question shall be limited upto 500 words. Each question carries 10 marks.

PART – A

1. i Draw a simple block diagram of real time system.
   ii What are timing constraints?
   iii Describe important features of clock driven scheduling approach.
   iv Name different types of real time scheduling algorithms.
   v What is priority ceiling protocol?
   vi What are severe effects of resource contention?
   vii Define multiprocessor priority ceiling protocol?
   viii Define the term temporal distance constraints for tasks.
   ix What are some modern applications that use real time communication?
   x How does resource reservation protocol work?

PART – B

2. i What is real time system? Explain using suitable example, how it is different from general purpose computer system?
   OR
   ii Differentiate between processors and resources for a system.

3. i Describe clock driven and weighted round robin scheduling algorithm.
   OR
   ii Give advantages and disadvantages of clock driven scheduling.

4. i Differentiate between priority ceiling protocol and inheritance protocol.
   OR
   ii What is stack based priority ceiling protocol? Enlist its characteristics.

5. i Write a short note about end-to-end tasks in heterogeneous systems.
   OR
   ii Illustrate the importance of predictability and validation of dynamic multiprocessor systems.

6. i Explain briefly about medium access control protocol.
   OR
   ii Using suitable diagram give an overview of real time operating systems.

PART – C

7. What are characteristics of 'Real Time System Control'? Explain differences between soft and hard RTS.

8. Differentiate between offline and online scheduling approaches in real time.

9. Explain the concept of concurrent access of data objects.

10. Using suitable diagram, explain the model of real time multiprocessors and distributed systems.

11. Explain the detailed model of real time operating system. Also give some important applications in modern world.