

Hall Ticket Number :

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R-15

Code: 5G311

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

Electronic Devices and Circuits-I

(Common to EEE & ECE)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70Marks)

UNIT-I

1. a) Find the color coding for the give resistance values.
i) 2.7 K Ω ii) 4.2 K Ω iii) 5.6 K Ω iv) 8.2 K Ω 8M
b) Explain the types of resistors, capacitors, and inductors. 6M

OR

2. a) Draw and explain the symbols for voltage source, and current source. 6M
b) Write the properties and applications of capacitors and inductors. 8M

UNIT-II

3. a) State and explain ohms law and Kirchoff's voltage law (KVL). 8M
b) State and explain Thevenin's theorem. 6M

OR

4. a) State and explain Norton's theroem. 7M
b) State and explain maximum power transfer theorem. 7M

UNIT-III

5. a) What is Fermi level? Indicate the position of Fermi level in intrinsic, N-type, P-type semiconductor band diagrams. 8M
b) Compare Zener breakdown and avalanche break down. 6M

OR

6. a) Draw and explain energy band diagrams for P and N type semiconductors. 8M
b) Explain temperature dependency of PN diode. 6M

UNIT-IV

7. a) Compare the performance of L, C, L-section and π -section filters. 8M
b) Derive an expression for ripple factor of full wave rectifier. 6M

OR

8. With a neat sketch, explain the operation of full wave rectifier with C-filter and derive expression for ripple factor. 14M

UNIT-V

9. a) With respect to BJT, explain the following terms.
i) emitter efficiency ii) early effect 8M
b) Explain how BJT acts as an amplifier. 6M

OR

- 10 a) Write the current components in PNP transistor and explain. 6M
b) Draw and explain the input and output characteristics of BJT in common emitter configuration , 8M

Code: 5G513-B

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

Engineering Drawing

(Electrical & Electronics Engineering)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70Marks)

UNIT-I

1. Draw a regular hexagon of side 50, Draw another regular pentagon on outside of any one of the side of the regular hexagon.

OR

2. Draw a regular hexagon such that whose area is equal to 93.55 sq.cm(approximately)

UNIT-II

3. The major axis of an ellipse is 120 and the distance between the foci is 80. Determine the minor axis. Draw the curve by foci method.

OR

4. Construct a hyperbola with the distance between the focus and the directrix as 50 and eccentricity as $3/2$, also draw normal and tangent to the curve at appoint 30 from the axis.

UNIT-III

5. A circle of 60 diameter rolls along a straight line. Trace the path of the points P and Q located at distances of 20 and 40 from the centre of the rolling circle. Name the curve.

OR

6. Construct an epi cycloid taking the diameter of the rolling circle and generating circle as 50.

UNIT-IV

7. Draw the projections of the following points keeping the distance between the projectors as 25 on the same reference line.

- (a) A – 25 above HP and 45 in front of VP
- (b) B – 35 above HP and 50 behind VP
- (c) C - on the HP and 35 in front of VP
- (d) D – on both HP and VP
- (e) E – 50 above HP and on the VP.

OR

8. A point A is on HP and 40 in front of VP Another point B is on VP and below HP. The line joining their front view makes an angle 45° with xy line, while the line joining their top views makes an angle of 30° . Find the distance of the point B from HP.

UNIT-V

9. A line AB of 70 long is inclined at 45° to HP and 30° to VP. Its end A is on HP and 25 in front of VP. Draw its projections.

OR

10. A line of 90 long is parallel to and 20 in front of VP. Its end is in the HP while the other end is 40 above HP. Draw the projections of the line and find its inclination with HP.

Code: 5GC14

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

Engineering Mathematics-I

(Common All Branches)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70Marks)

UNIT-I

1. a) Solve $3x(1-x^2)y^2 \frac{dy}{dx} + (2x^2-1)y^3 = ax^3$ 7M

b) Find the Orthogonal trajectory of the family of confocal conics $\frac{x^2}{a^2 + \lambda} + \frac{y^2}{b^2 + \lambda} = 1$,
} being the parameter. 7M

OR

2. a) Solve $\cos^2 x \frac{dy}{dx} + y = \tan x$ 7M

b) Find orthogonal trajectories of the family of curves $r^2 = a^2 \cos 2\theta$ 7M

UNIT-II

3. a) Solve $\frac{d^2 y}{dx^2} - 6 \frac{dy}{dx} + 9y = 6e^{3x} + 7e^{-2x} - \log 2$ 7M

b) Solve by the method of variation of parameters $\frac{d^2 y}{dx^2} + y = \operatorname{Cosec} x$ 7M

OR

4. a) Solve $(D^3 - D)y = 2x + 1 + 4 \cos x + 2e^x$ 7M

b) Solve by the method of variation of parameters $y^{11} - 6y^1 + 9y = \frac{e^{3x}}{x^2}$ 7M

UNIT-III

5. a) Solve in series the equation $\frac{d^2 y}{dx^2} + y = 0$, $y(0) = 0$ 7M

b) Prove that if $0 < a < b < 1$, $\frac{b-a}{1+b^2} < \tan^{-1} b - \tan^{-1} a < \frac{b-a}{1+a^2}$ hence show that

$$\frac{f}{4} + \frac{3}{25} < \tan^{-1} \frac{4}{3} < \frac{f}{4} + \frac{1}{6}$$
 7M

OR

6. a) Solve in series the equation $\frac{d^2 y}{dx^2} + xy = 0$ 7M

b) Using Taylor's series, express the polynomial $2x^3 + 7x^2 + x - 6$ in powers of $(x-1)$ 7M

UNIT-IV

7. a) If $U = \log(x^3 + y^3 + z^3 - 3xyz)$ prove that $\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z} \right)^2 U = \frac{-9}{(x+y+z)^2}$ 7M

b) In a plane triangle, Find the maximum value of $\cos A \cos B \cos C$. 7M

OR

8. a) If $u = x + y + z$, $uv = y + z$, $uvw = z$, show that $\partial(x, y, z) / \partial(u, v, w) = u^2 v$ 7M

b) A rectangular box open at the top is to have volume of 32 cubic ft. Find the dimensions of the box requiring least material for its construction. 7M

UNIT-V

9. Trace the curve $a^2 y^3 = x^2 (a^2 - x^2)$ 14M

OR

10. Trace the curve $r = a(1 + \cos \theta)$ 14M

Code: 5GC13

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

Engineering Physics
(Common to EEE & ECE)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70Marks)

UNIT-I

1. Distinguish between gas and solid state lasers with examples. 14M

OR

2. Explain the optical fibre communication system. 14M

UNIT-II

3. Describe with suitable diagram the powder method for determination of crystal structure. 14M

OR

4. a) With a neat diagram explain the production of ultrasonics by piezoelectric method 10M
b) What are the applications of ultrasonics? 4M

UNIT-III

5. a) Derive time independent form of Schrodinger's wave equation 10M
b) Write physical significance of Schrodinger's wave equation 4M

OR

6. a) Discuss the motion of an electron in a periodic lattice and explain the formation of energy bands 10M
b) Describe salient features of quantum electron theory 4M

UNIT-IV

7. a) Explain the concept of drift and diffusion currents. How they are different? 5M
b) Derive Einstein relation in semiconductors and explain its significance. 9M

OR

8. a) Explain diamagnetism, paramagnetism and ferromagnetism. 8M
b) With the help of neat diagrams explain temperature dependence of susceptibility in the above materials. 6M

UNIT-V

9. a) List out the general properties of superconductor 10M
b) A lead superconductor with $T_c = 7.2$ K has a critical magnetic field of $6.5 \times 10^3 \text{Am}^{-1}$ at absolute zero. What would be the magnitude of critical magnetic field at 5K temperature 4M

OR

10. a) Describe the synthesis of nanomaterials by thermal evaporation method. 10M
b) Mention four applications of nanomaterials in material technology 4M

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R-15

Code: 5GC11

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

English through Literature

(Common All Branches)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70Marks)

UNIT-I

1. a) The poem "The Road not Taken" is about making choices. Discuss 7M
b) Why did Mini's father help Cabuliwallah? 7M

OR

2. Briefly discuss the various facets of G.D. Naidu's personality 14M

UNIT-II

3. a) Examine the values reflected by Rudyard Kipling in his poem "If" 7M
b) What kind of message Mark Twain tries to give through his story "A Dog's Tale"? 7M

OR

4. Estimate Sudha Murthy's contribution to society 14M

UNIT-III

5. a) Appreciate the story "The Gift of Magi" 7M
b) Interpret the poem "Leisure" 7M

OR

6. Discuss Vijaya Bhatkar as the architect of Indian IT industry. 14M

UNIT-IV

7. a) What kind of superstitious beliefs do you find in the poem "Night of the Scorpion"? 7M
b) Describe the astrologer in "An Astrologer's Day". 7M

OR

8. a) Write a few points about the childhood and early life of Bose. 7M
b) List out some of the achievements of Bose. 7M

UNIT-V

9. Analyse the character of Natalya in Chekhov's *The Proposal*. 14M

OR

10. Estimate the achievements of Homi Jehangir Baba in the field of science 14M

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R-15

Code: 5G111

I B.Tech. I Semester Regular & Supplementary Examinations December 2016

Problem solving Techniques and Introduction to C programming

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70Marks)

UNIT-I

1. a) What are the General Problem solving strategies? Discuss. 7M
- b) Define Algorithm? Write an algorithm to read three integers and find the biggest number. 7M

OR

2. Illustrate different phases of Software Development Life Cycle (SDLC) with a neat diagram. 14M

UNIT-II

3. a) Describe the various steps involved in executing a C program. 7M
- b) What is Type Conversion? Illustrate type conversion with suitable example. 7M

OR

4. a) Write and explain the structure of C Program. 6M
- b) What are precedence and associativity of operators? Explain them with an example. 8M

UNIT-III

5. a) Compare While and do.. While statements with suitable example code. 8M
- b) Write a program to display the numbers, 1 to 100 except 29, 77 and 86. 6M

OR

6. a) Discuss in detail about the for Loop statements in C. 7M
- b) Write about the functioning of the jump statements, **break** and **continue** with suitable examples. 7M

UNIT-IV

7. a) What is an Array? Explain how to declare one dimensional array with example. 8M
- b) Write a C program to find the sum of all elements in the array. 6M

OR

8. What are the different String Library functions available in C? Explain them with example. 14M

UNIT-V

9. a) What is a function? What are the advantages of using functions in a program? 8M
- b) Explain in detail about Preprocessor Commands. 6M

OR

10. a) Describe the two parameter passing methods with suitable examples. 7M
- b) What is a recursive function? Write a C program to find the factorial of a given number using recursion. 7M
