

Code: 5G311

I B. Tech. I Semester Supplementary Examinations May/June 2016

Electronic Devices & 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) Explain briefly types of sources. 8M
b) Give the comparison of three passive elements. 6M

OR

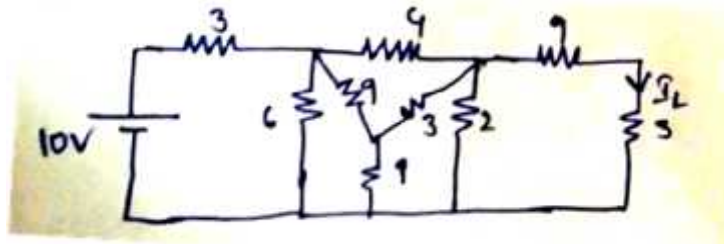
2. a) Explain about different types of capacitors and inductors. 6M
b) Determine the color coding for given resistance values
(i) 22K (ii) 2.2K (iii) 10K (iv) 10 8M

UNIT-II

3. a) Explain the dependent and independent sources. 6M
b) State and explain superposition theorem. 8M

OR

4. a) State and explain maximum power transformation theorem. 6M
b) State nortons theorem and find the current I_L using Nortons theorem in the following circuit. 8M

**UNIT-III**

5. a) Discuss briefly the effect of temperature on the characteristics of PN junction diode. 8M
b) The voltage across a silicon diode at room temperature of 300°K is 0.62V when 2mA current flow through it. If the voltage increases to 0.8V, calculate the new diode current. 6M

OR

6. a) Explain about breakdown mechanisms in semiconductor diodes. 8M
b) Explain the difference between transition and diffusion capacitances. 6M

UNIT-IV

7. a) A Full wave rectifier is supplied from 230V, 50Hz and uses a transformer of turn's ratio of 15:1. It uses load resistance of 50 . Calculate load voltage (V_{DC}) and ripple voltage. 6M
b) Explain how the Zener diode works as a regulator. 8M

OR

8. a) Explain the operation of Half wave rectifier with inductor filter and derive the Ripple factor. 14M

UNIT-V

9. a) Explain the working principle of NPN transistor. 8M
b) Explain about the applications of BJT transistor 6M

OR

10. a) Draw the circuit and explain the input and output characteristics of CE transistor configuration. 8M
b) Derive the relationship between i_{ac} and i_{dc} . 6M

Code: 5G513*I B.Tech. I Semester Supplementary Examinations May/June 2016***Engineering Drawing-I**

(Common to EEE, ECE, CSE & IT)

Max. Marks: 70

Time: 3 Hours

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

UNIT-I

1. a) Divide a line of 100 mm into (i) 15 equal parts (ii) 7 equal parts. 7M
b) Draw a pentagon of side 40 mm with one side vertical. 7M

OR

2. a) Bisect the angles (i) 75° (ii) 135° 7M
b) Inscribe a regular hexagon with two sides horizontal in a circle of 65 mm diameter. 7M

UNIT-II

3. Construct an ellipse of major axis = 80mm and minor axis = 45 mm by Oblong method. Draw a tangent to it at any convenient point. 14M

OR

4. Construct a hyperbola when the distance of the focus from the directrix is 65 mm and eccentricity is $3/2$. Draw a tangent and normal to it at any convenient point. 14M

UNIT-III

5. A circle of 55 mm diameter rolls along a straight line without slipping. Draw the curve traced by a point P on the circumference, for one complete revolution of the circle. Name the curve. Draw a tangent to the curve at a point on it 40 mm from the line. 14M

OR

6. Construct a hypocycloid, rolling circle of 50 mm diameter and directing circle of 120 mm diameter. Draw a tangent to it at a point 40 mm from the centre of directing circle. 14M

UNIT-IV

7. a) Draw the projections of the following points:
(i) A, 15 mm above the HP and 50 mm behind the VP.
(ii) B, in the HP and 30 mm behind the VP.
(iii) C, 50 mm from both the reference planes and lies in 3rd quadrant.
(iv) D, in the VP and 40 mm above the HP. 8M

- b) Two points A and B are in the HP. The point A is 30 mm in front of the VP, while B is behind the VP. The distance between their projectors is 75 mm and the line joining their top views makes an angle of 45° with reference line. Find the distance of point B from the VP. 6M

OR

8. a) A line PQ, 90 mm long, is in the HP and makes an angle of 30° with the VP. Its end P is 25 mm in front of the VP. Draw its projections. 7M
b) A 90 mm long line is parallel to and 25 mm in front of the VP. Its one end is in the HP while the other is 50 mm above the HP. Draw its projections and find its inclination with the VP. 7M

UNIT-V

9. A line AB, 75 mm long, has its end A 20 mm above the HP and 25 mm in front of the VP. The end B is 40 mm above the HP and 65 mm in front of the VP. Draw the projections of AB and show its inclinations with the HP and the VP. 14M

OR

10. A line AB, 90 mm long, is inclined at 45° to the HP and its top view makes an angle of 60° with the VP. The end A is in the HP and 12 mm in front of the VP. Draw its front view and find its true inclination with the VP. 14M

Code : 5GC13

I B.Tech. I Semester Supplementary Examinations May/June 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. a) Explain Fraunhofer diffraction of light at single slit and its intensity distribution. 10M
b) Write about important characteristics of laser. 4M

OR

2. a) Defining the terms obtain expressions for Numerical Aperture and Acceptance Angle of an optical fiber. 9M
b) With the help of block diagram, explain an optical fiber communication system. 5M

UNIT-II

3. a) Deduce the expression of distance of separation between two successive parallel (hkl) planes in a cubic crystal. 7M
b) Defining what is meant by defect in crystals, describe various point defects in crystalline solids. 7M

OR

4. a) Write in detail the powder X-ray diffraction method 8M
b) Explain the applications of ultrasonics in non-destructive testing of materials. 6M

UNIT-III

5. a) State Heisenberg's uncertainty principle. 2M
b) Applying time independent wave equation solve the case of motion of a particle between two infinite height impenetrable walls and plot probability amplitude and density for the first three allowed states. 12M

OR

6. a) On the basis of free electron theory derive expression for electrical conductivity. 7M
b) Write about Fermi-Dirac distribution function and its dependence on temperature. 7M

UNIT-IV

7. a) Distinguish between intrinsic and extrinsic semiconductors 4M
b) What is Hall effect? Derive expression of Hall coefficient in case of p-type semiconductors. 10M

OR

8. a) Plot and explain hysteresis loop in case of ferromagnetic materials. 7M
b) With examples, discuss classification of magnetic materials into soft and hard magnetic. 7M

UNIT-V

9. a) Define superconductivity and explain with relevant diagrams the effect of temperature and magnetic field on superconductivity 7M
b) Explain type-I & type-II superconductors 7M

OR

10. a) Explain synthesis of nanomaterials using sol-gel method and discuss its advantages over other methods. 8M
b) Write about carbon nano tubes and their properties. 6M

Code : 5GC14

I B.Tech. I Semester Supplementary Examinations May/June 2016

Engineering Mathematics-I

(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) Solve $ydx - xdy = \sqrt{x^2 + y^2} dx$ 7M
b) Find the orthogonal trajectory of the family of $r^n = a \sin n_\theta$ 7M

OR

2. a) Solve $\frac{dy}{dx} + x \sin 2y = x^3 \cos^2 y$ 7M
b) A tank contains 1000 gallons of brine in which 50 lt. of salt are dissolved. Fresh water runs into the tank at the rate of 10 gallons per minute and the mixture kept uniform by stirring, runs out at the same rate. How long will it be before only 50 lt. of salt is left in the tank? 7M

UNIT-II

3. a) Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = xe^x \sin x$ 7M
b) Solve $y'' + 4y = x \sin x$ by the method of variation of parameters 7M

OR

4. a) Solve $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = xe^{3x} + \sin 2x$ 7M
b) In an $L-C-R$ circuit, the charge q on a plate of a condenser is given by $L\frac{d^2q}{dt^2} + R\frac{dq}{dt} + \frac{q}{C} = E \sin pt$ The circuit is tuned to resonance so that $p^2 = 1/LC$. Find the current i 7M

UNIT-III

5. a) Solve in series of the equation $\frac{d^2y}{dx^2} + x^2y = 0$ 7M
b) Verify Rolles mean value theorem on $[0, 2]$ for the function $f(x) = 1 - (x-1)^{2/3}$ 7M

OR

6. a) Solve in series of $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} + (x^2 - 4)y = 0$ 7M
b) Verify Taylors theorem for $f(x) = (1-x)^{7/2}$ with Lagranges form of remainder upto 2 terms in the interval $[0, 1]$ 7M

UNIT-IV

7. a) Find the first and second partial derivatives of $z = x^3 + y^3 - 3axy$ 7M
b) Find the maxima and minima of $f(x, y) = x^3 + 3xy^2 - 3x^2 - 3y^2 + 4$ 7M

OR

8. a) If $\frac{x^2}{a^2+u} + \frac{y^2}{b^2+u} + \frac{z^2}{c^2+u} = 1$ then prove that $u_x^2 + u_y^2 + u_z^2 = 2(xu_x + yu_y + zu_z)$ 7M
b) Find the stationary values of $u = x^2 + y^2 + z^2$ subject to $ax^2 + by^2 + cz^2 = 1$ and $lx + my + nz = 0$ 7M

UNIT-V

9. Trace the curve $x^{2/3} + y^{2/3} = a^{2/3}$ 14M
OR
10. Trace the curve $x = a(\theta - \sin \theta)$, $y = a(1 - \cos \theta)$ where $(0 < \theta < 2\pi)$ 14M

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R-15

Code : 5GC11

I B.Tech. I Semester Supplementary Examinations May/June 2016

English through Literature

(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 kind of a lady was Mini's mother? Why was she suspicious of Cabuliwallah? 7M
- b) What do you think about the ending of the story "Cabuliwallah"? 7M

OR

2. Give an account of the life of G.D Naidu 14M

UNIT-II

3. a) The poem 'If' by Rudyard Kipling is a celebration of values. Explain. 7M
- b) How does the mother dog react to its puppy dog's death in 'A Dog's tale' by Mark Twain? 7M

OR

4. Why is Sudha Murthy considered a role model for young Indian women? 14M

UNIT-III

5. Do you think Jim and Della were wise? Give your reason. 14M

OR

6. a) Why does William Davies refer to the lives of modern world as poor lives? 7M
- b) What are the achievements of Dr.Vijay Bhatkar in the field of Information Technology? 7M

UNIT-IV

7. a) What kind of working analysis does the astrologer follow while making predictions? 7M
- b) What is the challenge thrown by the stranger to the astrologer? Who wins the challenge finally? 7M

OR

8. Describe the greatness of Sir.J.C.Bose 14M

UNIT-V

9. Give a detailed account of Homi Jehangir Bhabha's life in UK. 14M

OR

10. The play "The Proposal" is considered a satirical comedy. Explain your view. 14M

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Code: 5G111

I B. Tech. I Semester Supplementary Examinations May/June 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 is Programming Language? Explain about Computer Programming Languages with example. 7M
- b) Apply Software Development method to find roots of quadratic equation. 7M

OR

2. a) Define flowchart. Draw flowchart to find given number is Armstrong or not 7M
- b) Give short notes on computer environments. 7M

UNIT-II

3. a) Enlist the features of c language. 6M
- b) Define operator. Describe different types of operators used in c language with example. 8M

OR

4. a) Describe the structure of c program with suitable example. 8M
- b) Explain typedef AND enumerated type with suitable example. 6M

UNIT-III

5. a) Write a c program, which takes two integer operands and one Operator from the user, performs the specified operation and then prints the result (consider the operators +,-,*,/,% and use switch statement). 5M
- b) Explain break, continue and goto statements with suitable example. 9M

OR

6. a) Write a c program to find sum of series $1!+2!+3!+4!+\dots+n!$ 5M
- b) Explain while, do-while and for loop with suitable example Programs. 9M

UNIT-IV

7. a) Write a c program for sorting the elements of an array in descending order. 6M
- b) Define string. Explain declaration and initialization of string variables. 8M

OR

8. a) What is an array? How one-dimensional and two-dimensional arrays are declared and initialized. Give suitable example. 7M
- b) Explain strcpy, strcat, strcmp, strlen functions with suitable example programs. 7M

UNIT-V

9. a) What is function? Describe different categories of functions with suitable example programs. 10M
- b) Write a c program to find factorial of a number using recursion. 4M

OR

10. a) Explain the scope, visibility and lifetime of variables with suitable examples. 10M
- b) Describe preprocessor commands with suitable examples. 4M
