Hall Ticket Number :										

R-17

Code: 7G221

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

Basic Electrical and Electronics Engineering

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

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

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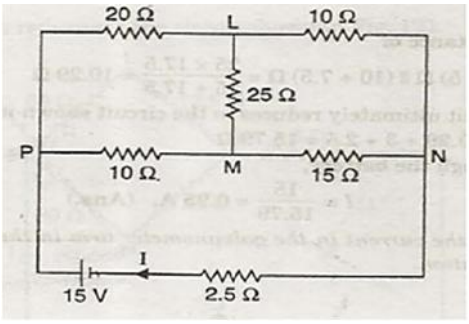
UNIT–I

1. a) Define i)Active and Passive Elements ii)Unilateral and Bilateral Elements 4M

   b) Find the current I supplied by the battery using Star /Delta transformation.

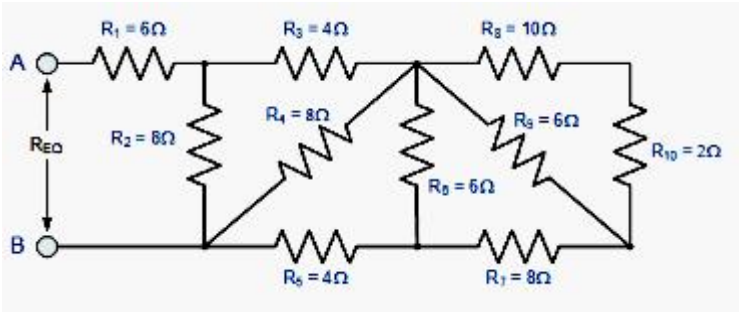


10M

OR

2. a) Derive the expression for the equivalent capacitance of parallel combination of Three capacitances with 6μF each. 4M

   b) Find the Equivalent resistance of the circuit shown below between A and B using series parallel connection.



10M

UNIT–II

3. a) What is the significance of Back Emf of DC motor? 4M

   b) What is the necessity of 3 point starter and explain the working principle with neat sketch. 10M

OR

4. a) A 4-pole, lap wound, DC generator has a useful flux of 0.07 wb per pole. Calculate the generated emf, when it is rotated at a speed of 900 rpm with the help of prime mover. Armature consists of 440 numbers of conductors. Also calculate the generated emf. If lap wound armature is replaced by wave wound armature. 7M

   b) Draw the characteristics of DC shunt motor and DC Series motor with brief explanation. 7M

UNIT–III

5. a) A 25 KVA single phase 2300v/250v 50hz transformer has the following test results

O.C TEST: 2300V, 150W, 10A

S.C TEST: 100V, 7500W,100A

Calculate the efficiency at half load at unity power factor, 0.8 P.F and find the efficiency corresponding to maximum efficiency? 9M

b) Write a short notes on synchronous impedance method of an Alternator. 5M

OR

6. a) Draw the constructional diagram of 1 Φ transformer and discuss the main parts. 8M

b) Draw the Torque slip characteristics of 3Φ Induction motor. 6M

UNIT–IV

7. a) Discuss the operation of P-N junction diode with applications. 7M

b) Draw the Bridge rectifier and discuss the operation of circuit. 7M

OR

8. a) Discuss the operation of NPN and PNP transistors 7M

b) Determine the expressions for voltage gain, current gain, output impedance and input impedance of a CE amplifier. 7M

UNIT–V

9. a) Discuss the principle of operation of Induction heating. 8M

b) List out the advantage and applications of dielectric heating. 6M

OR

10. a) Discuss the working of CRO with neat sketch. 8M

b) Discuss the operation of CRO for voltage and current measurements. 6M

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Hall Ticket Number :										

R-17

Code: 7GC23

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

Engineering Physics

(Common to CE, ME and CSE)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) Explain the construction and working of He – Ne laser 8M

   b) Newton's rings are observed in the reflected light of wave length 5900 Å. The diameter of 10th dark ring is 0.5 cm. Find the radius of curvature of the lens used. 6M

OR

2. a) Discuss the point to point optical fiber communication system and mention its advantages over the conventional communication systems 8M

   b) The angle of acceptance of an optical fiber is 30^0 when kept in air. Find the angle of acceptance when it is in a medium of refractive index 1.33. 6M

UNIT–II

3. a) Derive Bragg's law for X-ray diffracton 8M

   b) Copper has fcc structure of atomic radius 0.1278 nm. Calculate the interplanar spacing for (3 2 1) plane. 6M

OR

4. a) What is space lattice? Describe briefly the seven systems of crystals 7M

   b) Explain the various detection methods for ultrasonics. 7M

UNIT–III

5. a) Setup time-independent Schrodinger wave equation in one dimension and explain Eigen function and Eigen values 7M

   b) Define Fermi energy and Fermi factor. Discuss the probability of occupation of electrons when $E<E_f$ and $E>E_f$. 7M

OR

6. a) What is wave function? Give its physical significance and properties 8M

   b) Find the relaxation time of conduction electrons in a metal of resistivity 1.54×10^{-8} ohm-m, if the metal has 5.8×10^{28} conduction electrons per m^3. 6M

UNIT–IV

7. a) Describe with suitable diagrams the construction and action of a P-N junction diode 8M

   b) Give a brief account of high temperature superconductivity 6M

OR

8. a) Describe in short the formation of energy bands in solids and hence explain how it helps to classify materials into conductors and insulators 8M

   b) The Hall co-efficient of a material is -3.68×10^{-5} m^3/C. What is the type of charge carriers? Also calculate the carrier concentration. 6M

UNIT–V

9. a) Explain magnetic hysteresis on the basis of domain theory 7M

   b) Explain in detail any two applications of nanotechnology 7M

OR

10. a) Discuss the applications of hard and soft magnets 7M

    b) Explain the synthesis of nanomaterials using sol-gel method 7M

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Hall Ticket Number :										

R-17

Code: 7GC21

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

Environmental Science

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) Define Environment. How does urbanization impact environment? 7M

   b) Knowledge about the environment is not an end, but rather a beginning. Explain. 7M

OR

2. a) List any seven environmental studies centers in India. 7M

   b) Explain the scope of environmental engineering. 7M

UNIT–II

3. a) Explain the common causes of deforestation around the world. 7M

   b) Discuss the impact of drought and floods. Explain control measures with suitable case study. 7M

OR

4. a) What are solar cells? Draw a diagram and enumerate its applications. 7M

   b) Discuss the various types of land degradation with its causes and solutions. 7M

UNIT–III

5. a) What are food chains and food webs? Discuss their significance with suitable examples. 7M

   b) Discuss the salient features of an estuarine ecosystem. 7M

OR

6. a) Explain hotspots of biodiversity identified in India. 7M

   b) What is meant by in-situ and ex-situ conservation of biodiversity? Give examples. 7M

UNIT–IV

7. a) List the major air pollutants and explain their effects on human beings. 7M

   b) Write short notes on –

   i. Eutrophication. **ii**. Itai – itai. **iii**. Blue baby syndrome. 7M

OR

8. a) Give an account of noise generated during Diwali – the festival of lights. What would you suggest to reduce this menace? 7M

   b) Describe the human activities contributing to large scale thermal pollution. 7M

UNIT–V

9. a) Explain the phenomenon of global warming and the factors contributing to it. 7M

   b) Write short notes on –

   i. Air (prevention and control) Act. ii. Wildlife protection Act 7M

OR

10. a) What is rainwater harvesting? Describe the purposes served by rainwater harvesting? 7M

    b) Give examples of ethical issues frequently discussed in the subject Environmental ethics. 7M

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Hall Ticket Number :										

R-17

Code: 7G121

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

Data Structures

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. a) What is a pointer? List out the advantages and disadvantages using a pointer. 7M
   b) Distinguish between call by value and call by reference by means of a program. 7M

OR

2. a) What is Dynamic Memory Allocation? Write syntax for malloc(), calloc() and free(). 7M
   b) Discuss command line arguments with an example. 7M

UNIT–II

3. a) Distinguish between Structure and Union and also mention their applications. 4M
   b) Explain Quick sort with the help of an example 10M

OR

4. a) Briefly explain File handling in C 10M
   b) Compare Linear search and Binary search. 4M

UNIT–III

5. a) What is stack? Specify any four applications where stacks are extensively used. 4M
   b) Write a routine to convert the following infix expression in to postfix expression: **a+b*c/(e+f*g)** 10M

OR

6. a) What is Queue? Specify any four applications where queues are extensively used. 4M
   b) Write a routine to implement circular queue. 10M

UNIT–IV

7. a) What is the difference between singly, doubly & circular linked lists? 7M
   b) Write a program to delete a node from the beginning of the linked list 7M

OR

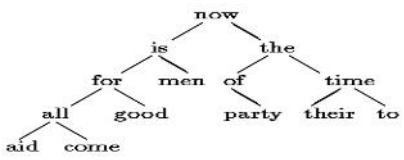
8. a) Write a program to create a singly linked list in sorted order. 7M
   b) Summarize doubly linked list. 7M

UNIT–V

9. a) Explain Array representation of Binary tree 7M
   b) Define Graph and explain various graph representations. 7M

OR

10. Write the in order, preorder, and post order sequence of nodes for the following binary tree



14M

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Hall Ticket Number :										

R-17

Code: 7GC24

I B.Tech. II Semester Supplementary Examinations Nov/Dec 2019

Engineering Mathematics-II

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

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

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UNIT–I

1. Change the order of integration and evaluate $\int_0^1 \int_{x^2}^{2-x} xydxdy$ 14M

OR

2. a) Evaluate $\int_3^4 \int_1^2 \frac{xdxdy}{(x+y)^2}$ 7M

b) Evaluate $\int_0^3 \int_1^2 \int_0^{x+y} (x+y+z)dz\,dy\,dx$. 7M

UNIT–II

3. a) Find the Laplace transform of $te^{-2t}Sint$ 7M

b) Evaluate $\int_0^\infty \frac{Cos\,6t - Cos\,4t}{t} dt$ by using Laplace transforms 7M

OR

4. Express $f(t) = \begin{cases} t^2, 0 < t < 2 \\ 4t, t > 2 \end{cases}$ interms of heavisides unit step function hence find its Laplace transform. 14M

UNIT–III

5. Use convolution theorem to evaluate $L^{-1}\left[\frac{s^2}{(s^2+a^2)^2}\right]$. 14M

OR

6. Solve the differential equation $y'' + y = e^{-2t}Sin\,t, y(0) = 0\ y'(0) = 0$ using Laplace Transforms. 14M

UNIT–IV

7. a) Show that $F = (e^x \cos y + yz)i + (xz - e^x \sin y)j + (xy + z)k$ is conservative over its natural domain and find potential function for it. 7M

b) Find the unit outward drawn normal to the surface $(x-1)^2 + y^2 + (z+2)^2 = 9$ at the point (3,1,-4). 7M

OR

8. Find the total work done in moving a particle in a force field $\bar{A} = 3xyi - 5zj + 10xk$ along the curve $x = t^2 + 1, y = 2t^2, z = t^3$ from $t=1$ to $t=2$. 14M

UNIT–V

9. Verify Stokes theorem for the function $\bar{f} = x^2 i + xyj$, integrated round the square in the plane $z=0$, whose sides are along the lines $x=0, y=0, x=a, y=a$. 14M

OR

10. Verify Green's theorem for $\int_C (y - Sinx)dx + Cos\,x\,dy$, where C is the plane triangle enclosed by the lines $y=0$, $x=\frac{\pi}{2}$ and $y=\frac{2}{\pi}x$. 14M

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