Hall Ticket Number :										

R-17

Code: 7GC24

I B.Tech. II Semester Supplementary Examinations December 2022

Engineering Mathematics-II

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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UNIT–I

1. Change the order of integration in $\int_0^1 \int_x^{\sqrt{2-x^2}} \frac{x}{\sqrt{x^2+y^2}}\,dy\,dx$ and hence evaluate it. 14M

OR

2. a) Change of order of integration and evaluate $\int_0^\infty \int_x^\infty \frac{e^{-y}}{y}\,dx\,dy$ 7M

   b) Evaluate $\int_0^a \int_0^x \int_0^{x+y} e^{x+y+z}\,dz\,dy\,dx$ 7M

UNIT–II

3. a) Evaluate $\int_0^\infty e^{-2t}\,\mathrm{Sin}^3 t\,dt$ 7M

   b) Obtain the Laplace Transform of $f(t)=\begin{cases}(t-1)^2 & ;\ t>1\\ 0 & ;\ 0<t<1\end{cases}$ 7M

OR

4. a) Find the Laplace Transform of $\frac{\mathrm{Cos}\,at-\mathrm{Cos}\,bt}{t}$ 7M

   b) Find the Laplace Transform of t^2e^{-3t}. 7M

UNIT–III

5. Using Convolution Theorem, Find $L^{-1}\left\{\frac{s^2}{(s^2+4)(s^2+9)}\right\}$ 14M

OR

6. a) Find the inverse transform of $\frac{1}{s(s^2+a^2)}$. 7M

   b) Find the inverse transform of $\frac{s+2}{s^2-4s+13}$. 7M

UNIT–IV

7. Show the vector $(x^2-yz)\bar{i}+(y^2-zx)\bar{j}+(z^2-xy)\bar{k}$ is irrotational and find it's scalar potential. 14M

OR

8. a) Evaluate $curl\ of\ \bar{V}=e^{xyz}(\bar{i}+\bar{j}+\bar{k})$ at the point $(1,2,3)$. 7M

   b) Prove that $div\,curl\,\bar{F}=0$ 7M

UNIT–V

9. Verify Green's Theorem in the plane for $\int_c [(3x^2-8y^2)dx+(4y-6xy)dy]$ where 'c' encloses the region bounded by $y=\sqrt{x}$ and $y=x^2$ 14M

OR

10. Verify stoke's theorem for a vector field $\bar{F}=(x^2+y^2)\bar{i}-2xy\,\bar{j}$ taken round the rectangle bounded by the lines $x=\pm a,\ y=0,\ y=b$. 14M

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Hall Ticket Number :										

R-17

Code: 7GC23

I B.Tech. II Semester Supplementary Examinations December 2022

Engineering Physics

(Common to CE, ME, CSE & IT)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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Marks

UNIT–I

1. a) Derive the expression for Diameter of Newton's Ring 8M
   b) Explain the Diffraction greeting spectrum. 6M

OR

2. a) Explain the production of Laser rays by ruby laser method 7M
   b) Explain optical communication system. 7M

UNIT–II

3. Define miller indices and write conditions for finding miller indices 6M
   Derive packing fraction of S.C and B.C.C 8M

OR

4. a) Deduce Bragg's law equation 9M
   b) What is ultrasonic and write properties 5M

UNIT–III

5. a) State de-Broglie hypothesis of dual nature and derive its wavelength 10M
   b) Write the sources of electrical resistance 4M

OR

6. Analyze the particle in one dimensional box 14M

UNIT–IV

7. a) Define and explain drift and diffusion currents in semiconductors 8M
   b) what is LED brief it 6M

OR

8. a) Brief BCS theory and Flux quantization 8M
   b) Justify the diamagnetic nature of superconductors 6M

UNIT–V

9. a) Explain the production of nano materials by ball milling method 10M
   b) What is CNT and explain it 4M

OR

10. a) Differentiate any three of dia , para , ferro, antiferro and ferrite 10M
    b) classify soft and hard magnetic materials 4M

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Hall Ticket Number :										

R-17

Code: 7GC21

I B.Tech. II Semester Supplementary Examinations December 2022

Environmental Science

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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UNIT–I

1. a) List out different branches of science having close relationship with environmental studies. 7M
   b) Discuss briefly the importance of environment. 7M

OR

2. a) Explain how is environmental studies is in multidisciplinary in nature. 7M
   b) Differentiate between hydrosphere and lithosphere. 7M

UNIT–II

3. a) What are renewable and nonrenewable natural resources? Give examples. 7M
   b) Summarize the causes of deforestation. 7M

OR

4. a) Describe the environmental problems associated with extraction of mineral resources. 7M
   b) Discuss the consequences of over grazing. 7M

UNIT–III

5. a) Describe the components of an ecosystem. 7M
   b) Explain briefly the ex situ conservation of biodiversity. 7M

OR

6. Explain the food chain and food web with suitable examples and discuss their significance. 14M

UNIT–IV

7. a) List and explain the control measures of air pollution. 7M
   b) Identify and explain the human activities contributing to large scale water pollution. 7M

OR

8. a) What are the natural and manmade pollutants that cause environmental pollution? 7M
   b) Discuss in detail the role of an individual in prevention of pollution. 7M

UNIT–V

9. a) State how environment and human health are related. 7M
   b) Discuss in detail the methods of rain water harvesting. 7M

OR

10. a) Value education has an important effect on environmental conservation. Justify. 7M
    b) Discuss in detail the necessity of rain water harvesting. 7M

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Hall Ticket Number :										

R-17

Code: 7G221

I B.Tech. II Semester Supplementary Examinations December 2022

Basic Electrical and Electronics Engineering

(Computer Science and Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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UNIT–I

1. a) Formulate the expression for equivalent inductance of two parallel connected inductors. 7M
   b) Determine the current in the 8 Ω resistor for the circuit as shown in Fig.1

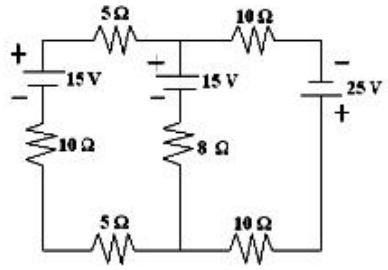

Fig. 1 7M

OR

2. a) Derive the expression for star to delta transformation. 7M
   b) Define the Ohm's Law and its applications. 7M

UNIT–II

3. Explain classification of a DC generator along with suitable diagrams and voltage and current relationship. 14M

OR

4. a) Explain briefly about Three point starter with a neat sketch. 7M
   b) Explain the operation of principle of DC generator. 7M

UNIT–III

5. A 400V, 10KVA, 3-Φ alternator with star connected stator winding has an effective armature resistance per phase of 1.0 Ω. The alternator generates an open circuit voltage per phase is 90V with a field current of 1.0A. During the short circuit test, with 1.0A of field current the short circuit current flowing in the armature is 15A. Calculate a)The synchronous impedance b) Synchronous reactance 14M

OR

6. a) Explain the various losses that occur in single phase transformer. 7M
   b) Derive the expression for E.M.F equation of a transformer. 7M

UNIT–IV

7. A Bridge rectifier is applied with input from a step down transformer having turns ratio 8:1 and input 230 V, 50 Hz. If the R_f = 1 Ω, Rs = 10 Ω and R_L= 2 K Ω. Find a) DC Power output b) % of Efficiency c) % Regulation at full load d) PIV across the each diode. 14M

OR

8. a) Explain the operation of transistor as an amplifier. 7M
   b) Explain the operation of Bridge rectifier. 7M

UNIT–V

9. Explain the principle & theory of dielectric heating with necessary diagrams and list out the industrial application of dielectric heating. 14M

OR

10. a) List the applications of CRO. 7M
    b) Enumerate the applications of dielectric heating 7M

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Hall Ticket Number :										

R-17

Code: 7G121

I B.Tech. II Semester Supplementary Examinations December 2022

Data Structures

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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UNIT–I

1. a) Write a program to perform addition of array elements using pointer to array. 7M

   b) Explain the declaration of pointers and pointer to pointer with examples. 7M

OR

2. a) Explain dynamic memory allocation functions in C in detail. 7M

   b) What is the use of command line arguments 7M

UNIT–II

3. a) Write a program for sorting given numbers using selection sort technique 7M

   b) Write an algorithm for Binary search? Validate it with suitable data set? 7M

OR

4. Write a C program that defines a structure **employee** containing the details such as **empno, empname, department name and salary**. The structure has to store 20 employees in an organization. Use the appropriate method to define the above details and define a function that will display the contents? 14M

UNIT–III

5. Write an algorithm to convert a given infix expression into prefix expression. 14M

OR

6. Write a C Program to perform the following operations on a queue
   a) Insert b) Delete 14M

UNIT–IV

7. What is a Circular Linked List.? Explain different operations of a Circular linked list with suitable examples. 14M

OR

8. What are different types of linked list? Write a C function to count number of elements present in single linked list. 14M

UNIT–V

9. State binary search tree property. And construct the binary search tree for the following keys: G , K, L ,R, A, C, T, F, J, T, Y, E. 14M

OR

10. Define Graph and describe various representations of a graph with suitable examples. 14M

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