Total Printed Pages: 02

Roll No. : 0108CS211001

BT-1814
Examination –Dec.- 2021
B.Tech. I Sem : CSE, CSEICB, ME, AIADS, IoT
Communication Skills

Time : 3 Hrs

Max. Marks : 70
Min. Marks : 22

Note: Total number of questions are 05. All Questions are compulsory. Each Question has 4 parts (a, b, c, d). Part a, b & c are compulsory while Part d has internal Choice. Assume missing data, if any.
Word limit be observed as follows:
Part a – Max 50 words, Part b – Max 50 words,
Part c – Max 100 words and Part d – Max 400 words.
Word limit NOT to be followed for diagram, numerical, derivation.

Q.1 (a) Do as directed: 02

(i) They have never seen a sunrise. (Change the voice)
(ii) She wants to become___engineer. (a/an/the)
(iii) Still waters run deep. (adjective/adverb/verb/noun)
(iv) Neither carpenter nor plumber ____ available. (was/were)

(b) (a) Complete the sentence using the correct verb form 02

My notebook with the colourful sticky notes____ (be) missing. (present tense)

(b) Complete the sentence with the correct conjunction.

She does not like apples__ does she like oranges.

(c) Fill in the blanks from the word bank. 03

There is a problem in my neighbourhood. Children have no safe place to run and play. The streets are filled ___ cars and buses. There are many holes and cracks ___ this sidewalk. There is garbage ___ the ground. The neighbourhood wants to find a safe place __children to play. They meet to talk ___ the problem. They decide to build a playground. It will make the neighbourhood a safe place for children____ play. Won't that be nice?

Word Bank, About, On, For, In, To, With

(d) What are the different kinds of nouns? Explain giving examples. 07

OR

What do you understand by subject-verb agreement? Explain. 07

Q.2 (a) Add suitable prefixes/suffixes. 02

a) Stealing other people's money is ___ (honest)
b) Mohan was wearing an____ hat (usual)

(b) One word substitution 02

a) The arrangement of events or dates in the order of their occurrence
b) A small shelter for a dog.

(c) A synonym may share an identical meaning with another word, but the two words are not necessarily interchangeable. Comment. 03

(d) Discuss the uses of dictionary and thesaurus. 07

OR

What is Jargon in communication? Elucidate. 07

Q.3 (a) Define the process of communication. 02

(b) List the semantic barriers of communication. 02

(c) Write a short note the importance of external communication in business. 03

(d) What do you understand by verbal and non-verbal communication? 07

OR

What do you understand by oral and written communication? 07

Q.4 (a) What is process of reading? 02

(b) What is note-taking? 02

(c) Discuss the advantages of active reading. 03

(d) Make a précis of the following passage. 07

Coffee is traditionally grown in Karnataka, Kerala, and Tamil Nadu in India. It is predominantly an export-oriented commodity and 65% to 70% of the coffee produced in the country is exported, while the rest is consumed within the country. In the international market, Indian Robusta is highly preferred for its good blending quality. Arabica coffee from India is also well received in the international market.

Coffee is an export product with low import intensity and high employment content. This is evident from the fact that more than six lakh persons are directly employed and an equal number of individuals get indirect employment from this sector. Arabica is a mild coffee, but the beans are more aromatic; it has a higher market value compared to Robusta beans.

On the other hand, Robusta has more strength and is therefore used in making various blends. Arabica is grown in higher altitudes than Robusta. The cool and equable temperature, ranging between 15°C and 25°C, is suitable for Arabica, while for Robusta, a hot and humid climate with temperature ranging from 20°C to 30°C is suitable. Arabica requires more care and nurture and is more suitable for large holdings, whereas Robusta is suitable irrespective of the size of the farm. Arabica is susceptible to pests and diseases such as White Stem Borer, leaf rust, and requires more shade than Robusta. The harvest of Arabica takes place between November and January, while for Robusta, it is from December to February.

OR

Write a paragraph on 'The advantages and disadvantages of online classes' 07

Q.5 (a) What do you mean by agenda? 02

(b) Define memorandum? 02

(c) Is report writing an important ingredient for any business? Comment. 03

(d) Write a letter to the local newspaper complaining about irregular cleaning of the roads and drains in your locality. 07

OR

Explain any one type of résumé with an example. 07

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Total Printed Pages: 02

Roll No. :0108CS211001

BT-1815
Examination –Dec.- 2021
B.Tech. I Sem : Common to all Branches
Engineering Mathematics - I

Time : 3 Hrs

Max. Marks : 70
Min. Marks : 22

Note: Total number of questions are 05. All Questions are compulsory. Each Question has 4 parts (a, b, c, d). Part a, b & c are compulsory while Part d has internal Choice. Assume missing data, if any.
Word limit be observed as follows:
Part a – Max 50 words, Part b – Max 50 words,
Part c – Max 100 words and Part d – Max 400 words.
Word limit NOT to be followed for diagram, numerical, derivation.

Q.1 (a) Write the statement of maclaurin's theorem. 02

(b) Write the statement of taylor's theorem. 02

(c) Expand $\log(1+x)$ by maclaurin's theorem. 03

(d) Discuss the maxima and minima of the function $u = \sin x \sin y \sin(x+y)$. 07

OR

Find the radius of curvature at the Point "t" of the curve. 07
$x = a(t + \sin t)$, $y = a(1 - \cos t)$

Q.2 (a) Write the statement of Euler's theorem for two variable 02

(b) If $u = f(y/x)$ Show that $x\,\partial u/\partial x + y\,\partial u/\partial y = 0$ 02

(c) If $u = \log(x^3 + y^3 + z^3 - 3xyz)$ then prove that $\partial u/\partial x + \partial u/\partial y + \partial u/\partial z = 3/(x+y+z)$ 03

(d) If $u = f(r)$, Where $r^2 = x^2 + y^2$ Show that $\partial^2 u/\partial x^2 + \partial^2 u/\partial y^2 = f''(r) + 1/r\, f'(r)$. 07

OR

If $u = \sin^{-1}(x+y)/\sqrt{x} + \sqrt{y}$ 07
Prove that $x^2\,\partial^2 u/\partial x^2 + 2xy\,\partial^2 u/\partial x\,\partial y + y^2\,\partial^2 u/\partial y^2 = \sin u \cos 2u/4\cos^3 u$

Q.3 (a) Evaluate $\int_0^1 \int_0^1 xy\, dx\, dy$ 02

(b) Write the Duplication formula 02

(c) Evaluate limit of a sum in the form of a definite Integral 03

$$\text{Lim } n\to\infty \left\{\frac{1}{n+1} + \frac{1}{n+2} + \cdots + \frac{1}{2n}\right\}$$

(d) State and prove Relation between Beta and gamma function. 07

OR

Change the order of integration in the double integral $\int_0^{2a} \int_{\sqrt{(2ax-x^2)}}^{\sqrt{2ax}} V\,dx\,dy$ 07

Q.4 (a) Define Normal form of a matrix 02

(b) Find the characteristic roots of the matrix $A=\begin{bmatrix}5 & 4\\ 1 & 2\end{bmatrix}$ 02

(c) Find the rank of the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \\ 2 & 6 & 5 \end{bmatrix}$ 03

(d) Find the eigen values and eigen vectors of the matrix $A = \begin{bmatrix} 6 & -2 & 2 \\ -2 & 3 & -1 \\ 2 & -1 & 3 \end{bmatrix}$ 07

OR

Verify Caylay Hamilton theorem of $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 2 & 1 \\ 2 & 0 & 3 \end{bmatrix}$ and hence find A^{-1}. 07

Q.5 (a) Define Tautology and Contradiction. 02

(b) If p and q are two statements prove that $(p \wedge q) \Rightarrow p$ is a tautology 02

(c) Prove the Demorgan's law $(a+b)' = a'\,b'$. 03

(d) Prove that the number of vertices of odd degree in a graph is always even. 07

OR

Express the following function into disjunctive normal form: 07

$$F(x, y, z) = (x + y + z).\,(x.\,y + x'.z)'$$

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Total Printed Pages: 03 Roll No. : 0108C211001

BT-1813

Examination –Dec.-2021

B.Tech. I&II Sem : CSE, IoT

Engineering Graphics

Time : 3 Hrs Max. Marks : 70

Min. Marks : 22

Note: Total number of questions are 10. Attempt any one question (Including all part) from each unit. Assume missing data, if any, suitably.

UNIT-I

Q.1 (a) An area of 400 square centimetres on a map represents an area of 25 square kilometres on a field. Construct a scale to measure up to 5 km and capable to show a distance of 3.56 km. Indicate this distance on the scale. 07

(b) Draw an Involute of a hexagon of side 25 mm. 07

OR

Q.2 (a) The distance between two stations by rail is 50 km and it is represented on a certain map by a 1 cm long line. Find the R.F. and construct a diagonal scale showing single km and long enough to measure up to 700 km. Indicate a distance of 538 km on this scale. 07

(b) Draw a cycloid of a circle of diameter 50 mm for one revolution. Also, draw a tangent and a normal to the curve at a point 35 mm above the base line. 07

UNIT-II

Q.3 (a) The top view of an 80 mm long line AB measures 55 mm. The line is in the V.P. and its one end being 20 mm above the H.P. Draw its projections and find inclination with the H.P 07

(b) A 70 mm long line AB is parallel to the V.P. and inclined to the H.P. The end A is 20 mm above the H.P. and 30 mm in front of the V.P. The top view of the line measures 45 mm. Draw its projections 07

OR

Q.4 A line PQ has the end projectors 50 mm apart. The front and top views of the line are 55 mm and 65 mm long respectively. If the end P is 15 mm above the H.P. and 25 mm in front of the V.P., draw the projections of the line. Determine its true length and inclinations with the principal planes. Also, locate the traces. 14

UNIT-III

Q.5 A hexagonal plane of side 30 mm has an edge in the V.P. The surface of the plane is inclined at 45^0 to the V.P. and the edge on which it rests is inclined at 30^0 to the H.P. Draw its projections. 14

OR

Q.6 A hexagonal pyramid of base edge 30 mm and axis 60 mm, has a triangular face on the ground and the axis parallel to the V.P. Draw its projections. 14

UNIT-IV

Q.7 A cone of base diameter 50 mm and axis 60 mm is resting on its base in the H.P. Draw its sectional views and true shape of the section, if it is cut by a section plane perpendicular to the V.P., bisecting the axis and is parallel to the H.P. 14

OR

Q.8 Draw the development of the lateral surface of a square pyramid of base side 40 mm and axis 60 mm, resting on its base on the H.P. such that all the sides of the base are equally inclined to the V.P. 14

UNIT-V

Q.9 A square pyramid of base side 25 mm and axis 40 mm rests centrally over a cylindrical block of base diameter 50 mm and thickness 20 mm. Draw the isometric projection of the arrangement. 14

OR

Q.10 (a) What Is Drawing Entities? Name different drawing entities. 07

(b) What Are The Advantages Of Cad? 07

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Total Printed Pages: 03 Roll No. 0108CS211001

BT-1813

Examination – June -2022

B.Tech. I&II Sem : Common for all branch

Engineering Graphics

Time : 3 Hrs Max. Marks : 70

Min. Marks : 22

Note: Total number of questions are 10. Attempt any one question (Including all part) from each unit. Assume missing data, if any, suitably.

UNIT-I

Q.1 (a) A 4 cm length on a map represents 1.5 m length. Determine the R.F. and draw a scale long enough to measure up to 6m. Show a distance of 4.6 m on it. 07

(b) The major axis of an ellipse is 100 mm and minor axis 60 mm long. Draw an ellipse by concentric circle method. 07

OR

Q.2 (a) The distance between two stations by road is 200 km and it is represented on a certain map by a 5 cm long line. Find R.F. and construct a diagonal scale showing single kilometer and long enough to measure up to 600 km. Show a distance of 467 km on this scale. 07

(b) Draw an involute of a circle of 50 mm diameter. 07

UNIT-II

Q.3 A 70 mm long line PQ is inclined at 45^0 to the V.P. Its end P in the H.P. and 15 mm in front of the V.P. The top view of the line measure 60 mm. Draw its projections and determine true inclination with H.P. 14

OR

Q.4 The projectors of the ends of a line AB are 60 mm apart. The end A is 25 mm above H.P. and 30 mm in front of the V.P. The end B is 20 mm below H.P. and 40 mm behind the V.P. Determine the true length and inclination with the two planes. 14

UNIT-III

Q.5 (a) A hexagonal lamina with 30 mm sides has one of the sides perpendicular to V.P. The surface of the lamina is parallel to and 15 mm above H.P. Draw its projections. 07

(b) A square plane with 40 mm sides is situated in the V.P. with all the sides equally inclined to H.P. Draw its projections. 07

OR

Q.6 A hexagonal prism of 30 mm base edges and axis 65 mm long has an edge of its base in the H.P. such that the axis is inclined at 30^0 to the H.P. and parallel to V.P. Draw its projections. 14

UNIT-IV

Q.7 A square prism 25 mm base side and 69 mm height is kept on H.P. with its axis vertical and two adjacent base sides equally inclined to V.P. It is cut by a section plane whose V.T. makes an angle of 30^0 with the reference line and bisects the axis. Draw sectional top view and true shape of section. 14

OR

Q.8 A cone with a 50 mm base diameter and 60 mm long axis rests with its base on the H.P. Draw the development of its lateral surface when it is cut by an auxiliary inclined plane bisecting the axis and inclined at 60^0 to the H.P. 14

UNIT-V

Q.9 Draw an isometric view of the frustum of a cone of 50 mm base diameter, 25 mm top diameter and 60 mm height. 14

OR

Q.10 (a) Describe the snap and grid commands to regulate the cursor movement for locating a point quickly. 07

(b) Explain any two methods of drawing a circle in AutoCAD. 07

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Total Printed Pages: 02

Roll No. 0108CS211001

BT-1821
Examination – June - 2022
B.Tech. I/II Sem: Common for all branches
Engineering Physics

Time : 3 Hrs

Max. Marks : 70
Min. Marks : 22

Note: Total number of questions are 05. All Questions are compulsory. Each Question has 4 parts (a, b, c, d). Part a, b & c are compulsory while Part d has internal Choice. Assume missing data, if any.
Word limit be observed as follows:
Part a – Max 50 words, Part b – Max 50 words,
Part c – Max 100 words and Part d – Max 400 words.
Word limit NOT to be followed for diagram, numerical, derivation.

Q.1	(a)	Define coherence in optical sources.	02
	(b)	Differentiate between interference and diffraction patterns.	02
	(c)	Write a short note on Young's double slit experiment.	03
	(d)	Using a neat labeled diagram explain Newton's rings experiment.	07
		OR	
		Write a note on quarter and half wave plates.	07
Q.2	(a)	Explain Coulomb's law for electric field?	02
	(b)	Discuss Gauss's law for magnetic fields.	02
	(c)	Find divergence of vector $2\hat{x} - 3\hat{y} + 5\hat{z}$.	03
	(d)	Write Maxwell's equations.	07
		OR	
		Write a note on equation of continuity.	07
Q.3	(a)	State de-Broglie relation between momentum and wavelength.	02
	(b)	The analysis of particle in box revealed that the energy levels are (i) Continuous (ii) quantized. Write the correct option form (i) and (ii)	02
	(c)	Define wave function for matter waves.	03
	(d)	Deduce time independent Schodinger wave equation.	07
		OR	
		Write notes on (i) Phase velocity (ii) group velocity (iii) Uncertainty principle.	2+2+3
Q.4	(a)	Draw characteristics of a p-n diode.	02

(b) Superconductors have ..... resistance (Finite/ Infinite / Zero). 02

(c) What are semiconductors? Give an example of most common semiconductor material. 03

(d) Write a note on solar cell. 07

OR

Give some applications of nanotechnology. 07

Q.5 (a) Optical fibers works on the principle of 02

(b) The most important property of laser light is 02

(c) Explain population inversion in lasers. 03

(d) Discuss working of a Ruby laser. 07

OR

Describe the construction of an optical fiber. 07

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Total Printed Pages: 02

Roll No. : 0102CS211001

BT 1822

Examination – June - 2022

B.Tech. I/II Sem: Common for all branches

Basic Civil Engineering and Engineering Mechanics

Time : 3 Hrs

Max. Marks : 70

Min. Marks : 22

Note: Total number of questions are 05. All Questions are compulsory. Each Question has 4 parts (a, b, c, d). Part a, b & c are compulsory while Part d has internal Choice. Assume missing data, if any.

Word limit be observed as follows:

Part a – Max 50 words, Part b – Max 50 words,

Part c – Max 100 words and Part d – Max 400 words.

Word limit NOT to be followed for diagram, numerical, derivation.

Q.1 (a) State size of bricks. 02

(b) Enlist types of stones. 02

(c) Explain the material timber with neat sketch. 03

(d) Explain different types of laboratory test of cement. 07

OR

Classify different classes of the bricks and their properties. 07

Q.2 (a) Define force. 02

(b) State condition of equilibrium. 02

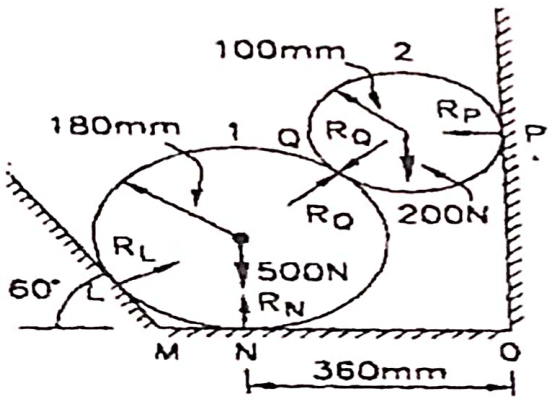
(c) State and proof lamis theorem. 03

(d) Define: 07

(i) polygon law of forces (ii) varignons theorem (iii) system of forces with sketch.

OR

Two cylinders **'1'** & amp; **'2'** rest in the horizontal channel as shown in figure. The cylinder **'1'** has a weight of **500 N** and radius of **180mm**. The cylinder **'2'** has a weight of **200 N** and a radius of **100 mm**. The channel is **360 mm** wide at the bottom with one side vertical. The other side is inclined at an angle 60^0 with the horizontal. Find the reactions. 07

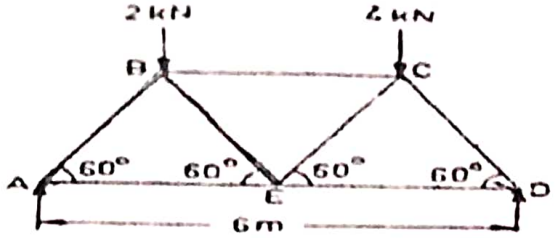


Q.3 (a) What are perfect truss 02

(b) State equation for perfect truss. 02

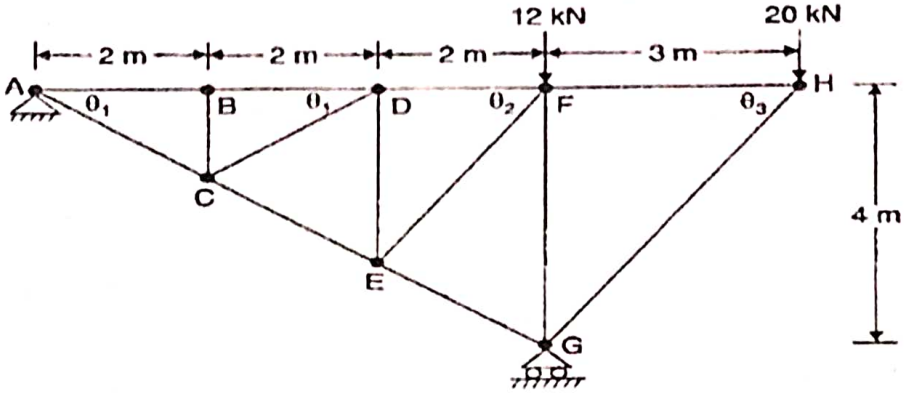
(c) State assumptions for analysing truss. 03

(d) Find the forces in all the members of the truss in figure. 07



OR

Find the forces in all the members of the truss shown in figure. 07



Q.4 (a) What is shear force? 02

(b) Define bending moment. 02

(c) Define beam. 03

(d) Explain the different types of beams and loadings with neat sketch. 07

OR

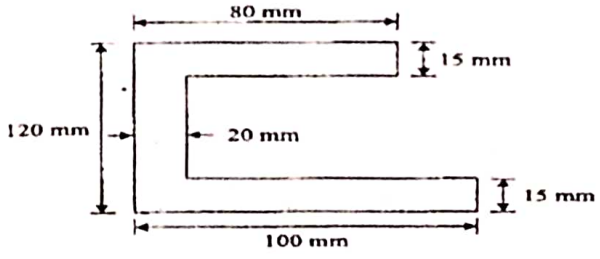
Find the support reactions for a simply supported beam of span **10 m** loaded with a udl of **3 kN/m.** 07

Q.5 (a) Differentiate between centroid and centre of gravity 02

(b) Define moment of inertia with suitable example. 02

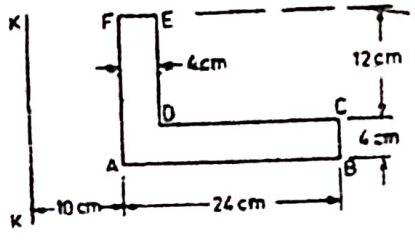
(c) State and proof perpendicular axis theorem 03

(d) Find out the centroid of the following section 07



OR

Compute the moment of inertia for the following section 07



Total Printed Pages: 02

Roll No. 0102CS211001

BT-1823
Examination – June - 2022
B.Tech. I/II Sem: Common for all branches
Basic Mechanical Engineering

Time: 3 Hrs

Max. Marks: 70
Min. Marks: 22

Note: Total number of questions are 05. All Questions are compulsory. Each Question has 4 parts (a, b, c, d). Part a, b & c are compulsory while Part d has internal Choice. Assume missing data, if any.
Word limit be observed as follows:
Part a – Max 50 words, Part b – Max 50 words,
Part c – Max 100 words and Part d – Max 400 words.
Word limit NOT to be followed for diagram, numerical, derivation.

Q.1 (a) What is the thermodynamic system? State the various types of thermodynamic system. 02

(b) State the first law of thermodynamics applied to a closed system. 02

(c) Compare fire tube and water tube boilers. 03

(d) Define coefficient of performance (COP) of heat pump and refrigerator. Prove that $[COP]_{HP} = [COP]_{Ref} + 1$ 07

OR

A refrigeration plant operates on a reversed Carnot cycle between the temperatures of $-10°C$ and $30°C$. If the capacity of the refrigerator is 200 tonnes of refrigeration, determine the minimum power required to run the plant. 07

Q.2 (a) What is Newton's law of viscosity? 02

(b) State the Bernoulli's equation for incompressible fluids. 02

(c) What is Reynold's number? State its physical significance? 03

(d) Discuss the working principle of fluid coupling with a neat sketch. 07

OR

Two plates are placed at a distance of 3 mm apart. The lower plate is fixed while the upper plate having a surface area of 1.0 m^2 is pulled with a speed of 2 m/s. Find the force required if the fluid placed between the two plates is having dynamic viscosity of 0.5 Pa.s. 07

Q.3 (a) How internal combustion (I.C.) engines are classified? 02

(b) Compare spark Ignition (S.I.) and compression ignition (C.I.) engine? 02

(c) State the working of four stoke petrol engine with a neat sketch? 03

(d) Show that the thermal efficiency of the Otto cycle depends only on the compression ratio. 07

OR

A petrol engine working on Otto cycle has piston displacement of 800 cc and clearance volume of 120 cc. Determine the air standard efficiency of petrol engine. 07

Q.4 (a) How the engineering materials are classified? 02

(b) Compare the ductile and brittle materials. 02

(c) What is Hook's law? Define modulus of elasticity. 03

(d) Draw and explain the stress-strain diagram for a ductile material. Show the important points on this diagram. 07

OR

Discuss the various mechanical properties of engineering materials. 07

Q.5 (a) How welding processes are classified? 02

(b) Compare the merits and demerits of A.C. and D.C. welding. 02

(c) State the three types of flames used in a gas welding with a neat sketch. 03

(d) What is lathe machine? Enumerate the basic operations which can be performed on lathe machine. 07

OR

What is drilling machine? Enumerate the basic operations which can be performed on drilling machine. 07

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Total Printed Pages: 03

Roll No. 01080S211001

BT-1812

Examination –Dec.- 2021

B.Tech. I/II Sem : CSE, CSEICB, ME, AIADS, IoT

Basic Electrical & Electronics Engineering

Time : 3 Hrs

Max. Marks : 70
Min. Marks : 22

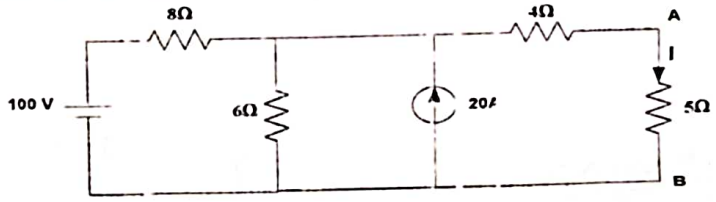
Note: Total number of questions are 05. All Questions are compulsory. Each Question has 4 parts (a, b, c, d). Part a, b & c are compulsory while Part d has internal Choice. Assume missing data, if any.
Word limit be observed as follows:
Part a – Max 50 words, Part b – Max 50 words,
Part c – Max 100 words and Part d – Max 400 words.
Word limit NOT to be followed for diagram, numerical, der vation.

Q.1 (a) Write any four source transformation? 02

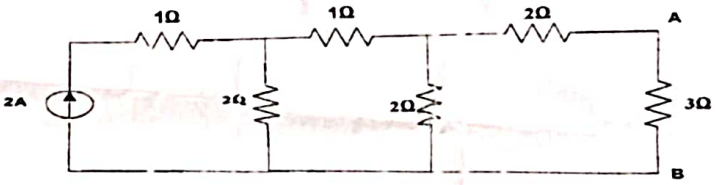
(b) Define: 02

(a) Linear Load (b) Non linear load
(c) Active source (d) Passive source

(c) Determine the current through 5Ω resistor in the circuit? 03

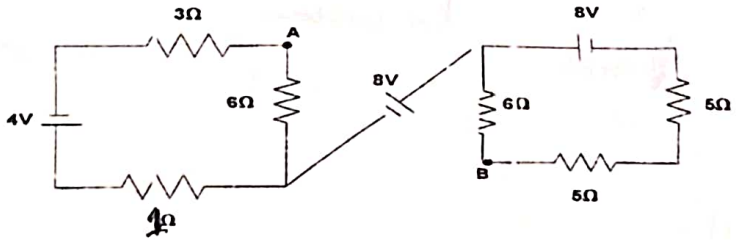


(d) Apply the thevenin's theorm and find V_{th} and R_{th} across the 3 Ω 07



OR

What is the difference of potential between the point A and B in the circuit shown below: 07



Q.2 (a) Draw the power triangle and explain active, reactive and apparent power. 02

(b) Determine the RMS value of 1 –phase sine wave. 02

(c) A RL series circuit draws a current of 1 A when connected across a 12V, 50Hz, AC supply. Assuming the resistance to be 4 Ω, find the inductance of the circuit. What is the power factor? 03

(d) Explain with phasor diagram three phase star connected system, and drive the relation of voltage and current. 07

OR

Three 100Ω resistor are connected first in star and then in delta across 415 V, 3-phase supply. Calculate the line and phase current in each and also power taken from the source. 07

Q.3 (a) A 2 KVA transformer 400/200 V, 50Hz, single phase transformer has Rp' = 3.0 Ω, Xp' = 4.0 Ω. Determine the regulation of transformer when operating at half load at 0.8 PF lagging. 02

(b) What are the different losses in transformer? 02

(c) Draw and explain the phasor diagram of transformer at no load and find the parameter for the same. 03

(d) Explain with the circuit diagram open circuit test and short circuit test, and the parameters calculated with these test. 07

OR

A 250/500 V transformer gave the following result:- 07

SC test with low voltage winding short circuited : 20V, 12A, 100W;

OC test on low voltage side: 250V, 1A, 80W. Determine the efficiency of transformer when the output is 10A, 500V, at 0.8PF lagging.

Q.4 (a) Drive the EMF equation of DC Motor. 02

(b) A 6 pole wave winding connected armature has 600 conductors and its driven at 525 rev/min. if the flux per pole is 10 mwb, determine the generated EMF 02

(c) Explain the working of induction motor. 03

(d) Explain the different parts of DC motor and its working. 07

OR

A 200 V shunt motor takes a total current of 25A. if the field winding resistance R = 100Ω, and the armature resistance $R_a = 0.2\ \Omega$, Determine (a) The current in the armature (b) Back emf. *07*

Q.5 (a) ADD the following 02

$$(AB5.789)_{16} + (754.324)_8$$

(b) Subtract the following 02

$$(0111011)_2 - (1010111)_2$$

(c) Explain the working of full bridge rectifier with clean wave form. 03

(d) Draw the logic diagram and truth table for 07

A(BC + A'C') (B + C'B') and no. of Gates required for the implementation of the above circuit.

OR

Solve the following 07

(i) $(0.5672)8 - (N)16$ (ii) 2's complement of 010111

(iii) $(1245.89)10 - (N)8$ (iv) Represent OR gate using NOR gate

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Total Printed Pages: 02 Roll No. :.....

BT-1824

Examination – June - 2022

B.Tech. I/II Sem: Common for all branches

Energy, Environment, Ecology & Society

Time : 3 Hrs Max. Marks : 70

Min. Marks : 22

Note: Total number of questions are 05. All Questions are compulsory. Each Question has 4 parts (a, b, c, d). Part a, b & c are compulsory while Part d has internal Choice. Assume missing data, if any.

Word limit be observed as follows:

Part a – Max 50 words, Part b – Max 50 words,

Part c – Max 100 words and Part d – Max 400 words.

Word limit NOT to be followed for diagram, numerical, derivation.

Q.1 (a) What is Marine Energy? Write various ways in which energy from the ocean can be obtained? 02

(b) How is the acid rain forming? 02

(c) Discuss the energy scenario in India. 03

(d) Discuss the characteristics of different atmospheric segments? 07

OR

What are primary air pollutants? Discuss the sources and relative contribution to air pollution? 07

Q.2 (a) Explain the concept of Energy Pyramids? 02

(b) Describe the component parts of an Ecosystem? 02

(c) Give classification and function of an Ecosystem? 03

(d) Discuss the structure and functions of following: 07

(i) Forest ecosystem

(ii) Pond ecosystem

OR

Explain in detail the Solid Waste Management and the methods of Recycling the waste? 07

Q.3 (a) What is decibel scale? 02

(b) What are the sources of air pollutants? 02

(c) Explain four major air pollutants and their consequences? 03

(d) Discuss the mechanism of Depletion of Ozone Layer. What are the adverse effects of Ozone Layer? 07

OR

What is global warming? Explain causes and effects of global warming? 07

Q.4 (a) What are the methods to minimize Soil Pollution? 02

(b) Differentiate between Organic and Inorganic water pollutants? 02

(c) Explain the term DO, BOD and COD? 03

(d) Give the flow diagram for the Activated Sludge Process and describe the working of the Activated Sludge Unit? 07

OR

Discuss the Waste Water Treatment of any of the four Common Industries? 07

Q.5 (a) What do you understand by moral values? 02

(b) Describe the Impact of waste on Society. 02

(c) What is Environmental Pollution? Discuss some Environmental Problems due to population and Technology? 03

(d) What is Environmental Impact Assessment? Why EIA is Required? Give Benefits of EIA? 07

OR

Define Ethics? Explain the Importance of ethics in society .Discuss various ethical situations? 07

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Total Printed Pages: 02

Roll No. 0108CS211001

BT-1825
Examination – June - 2022
B.Tech. I/II Sem: Common for all branches
Engineering Mathematics - II

Time : 3 Hrs

Max. Marks : 70
Min. Marks : 22

Note: Total number of questions are 05. All Questions are compulsory. Each Question has 4 parts (a, b, c, d). Part a, b & c are compulsory while Part d has internal Choice. Assume missing data, if any.
Word limit be observed as follows:
Part a – Max 50 words, Part b – Max 50 words,
Part c – Max 100 words and Part d – Max 400 words.
Word limit NOT to be followed for diagram, numerical, derivation.

Q.1 (a) Write the standard form of Linear differential equation. 02

(b) Find, Particular integral **(P.I.)** $(D^2+D+1)\,y = \sin 2x$ 02

(c) Find, complementary function **(C.F.)** $\frac{d^3y}{dx^3} - 3\frac{d^2y}{dx^2} + 4y = 0$ 03

(d) Solve : $\frac{d^2y}{dx^2} - 4y = e^x + sin2x$ 07

OR

Apply the method of variation of parameters to solve: $\frac{d^2y}{dx^2} + y = x$ 07

Q.2 (a) Define Legendre's linear differential equation. 02

(b) Give the C.F. of $x^3\frac{d^2y}{dx^2} - x^2\frac{dy}{dx} - 3xy = x^2$ 02

(c) Solve: $x^2\frac{d^2y}{dx^2} - 4x\frac{dy}{dx} + 6y = x.$ 03

(d) Solve: $x\frac{d^2y}{dx^2} - (2x-1)\frac{dy}{dx} + (x-1)y = 0.$ 07

OR

Solve: $\frac{dx}{dt} + 5x + y = e^t.$ 07

$\frac{dy}{dt} - x + 3y = e^{2t}.$

Q.3 (a) Write the form of Lagrange's equation and its auxiliary equation. 02

(b) Solve: $p + q = \sin 2x.$ 02

(c) Solve: $(D^2 + 3DD' + 2D'^2)\,z = \sin(2x + 3y).$ 03

(d) Solve: $(mz - ny)\,p + (nx - lz)\,q = ly - mx.$ 07

OR

A string is stretched between the fixed points **(0, 0)** and **(1, 0)** and released from rest from the position $u = A \sin \pi x$. Find the formula for its subsequent displacement **u(x, t).** 07

Q.4 (a) Define analytic function. 02

(b) Test the analytic behavior of $f(z) = \log z$. 02

(c) Use Cauchy-Riemann equation to find V . Where $u = 3x^2y - y^3$ 03

(d) State and prove Cauchy-Riemann equation in Cartesian co-ordinate. 07

OR

If $w = \emptyset + i\varphi$ is represents the complex potential for an electric field and $\varphi = x^2 - y^2 + \frac{x}{x^2+y^2}$, find the function of $\emptyset$. 07

Q.5 (a) Write the statement of Cauchy's Residue theorem . 02

(b) Find the order of each pole and residue at it of 02

$$\frac{1-2z}{z(z-1)(z-2)} .$$

(c) If **f(z)** is an analytic function and $f'(z)$ is continuous at each point within and on a simple closed curve C, then 03

$$\int_c f(z)\, dz = 0.$$

(d) State and prove Cauchy Integral Formula. 07

OR

Evaluate 07

$$\int_c \frac{(4-3z)dz}{z(z-1)(z-2)},$$

Where **c** is the circle $|z| = 3/2$.

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