11501

Roll No. _____ Total No of Pages: 4

11501

B. Tech. I - Sem. (Main) Exam., Dec. - 2018

BSC

1FY2 – 01 Engineering Mathematics - I

Time: 3 Hours **Maximum Marks: 160**

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 10 × 3 marks = 30 marks. All ten questions are compulsory.

Part – B: Analytical/Problem solving questions 5 × 10 marks = 50 marks. Candidates have to answer five questions out of seven.

Part – C: Descriptive/Analytical/Problem Solving questions 4 × 20 marks = 80 marks. Candidates have to answer four questions out of five.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART - A

Q.1 Evaluate the integral by using the Gamma function: [3]

$$\int_0^\infty e^{-x^2}\,dx$$

Q.2 Examine the convergence of the sequence $\{a_n\}$, where $a_n = \sqrt{n}\left(\sqrt{n+1} - \sqrt{n}\right)$ [3]

Q.3 State Parseval's theorem. [3]

Q.4 Show that $(x, y) \xrightarrow{\lim} (0, 0) \left[\frac{x}{\sqrt{x^2+y^2}}\right]$ does not exist. [3]

Q.5 Find the equation of the tangent plane to [3]

$z = x\sqrt{x^2+y^2} + y^3$ at (-4, 3).

Q.6 Find the values of a, b, c, so that $\vec{A}$ is irrotational, where [3]

$$\vec{A} = (x + 2y + az)\hat{i} + (bx - 3y - z)\hat{j} + (4x + cy + 2z)\hat{k}$$

Q.7 Evaluate $\int_C \vec{F} \cdot d\vec{r}$, where $\vec{F} = x^2y^2\hat{i} + y\hat{j}$ and C is the curve $y^2 = 4x$ in the xy – plane from (0, 0) to (4, 4). [3]

Q.8 Evaluate the double integration: [3]

$$\int_0^1 \int_0^{\sqrt{1+x^2}} \frac{1}{1+x^2+y^2}\, dx\, dy$$

Q.9 Prove by using Logarithmic series: [3]

$$\frac{1}{2} - \frac{1}{2}\cdot\frac{1}{2^2} + \frac{1}{3}\cdot\frac{1}{2^3} - \frac{1}{4}\cdot\frac{1}{2^4} + \ldots\ldots\ldots = \log\frac{3}{2}$$

Q.10 State Green's theorem in the plane. [3]

PART – B

Q.1 Evaluate $\int_0^\infty \frac{x^2(1+x^2)}{(1+x)^{10}}\ dx$ [10]

Q.2 Find the half – range cosine series for the function: $f(x) = 2x - 1$ for $0 < x < 1$. [10]

Q.3 Test the convergence of the series [10]

$$1 + \frac{x^2}{2} + \frac{x^4}{4} + \frac{x^6}{6} + \cdots$$

For all positive values of x.

Q.4 Show that the function: [10]

$$f(x, y) = \begin{cases} \frac{xy}{\sqrt{x^2+y^2}} & , \quad (x, y) \neq (0, 0) \\ 0 & , \quad (x, y) = (0, 0) \end{cases}$$

possess partial derivatives $f_x(0, 0)$ and $f_y(0, 0)$, though it is not continuous at (0, 0).

Q.5 Find the directional derivative of $\phi(x, y, z) = x^2 - 2y^2 + 4z^2$ at (1, 1, -1) in the direction of the vector $2\hat{i} + \hat{j} - \hat{k}$. Also find the direction of the maximum directional derivative at (1, 1, -1). [10]

Q.6 Evaluate $\iiint_R (x + y + z)\ dx\ dy\ dz$, where $R : 0 \leq x \leq 1, \quad 1 \leq y \leq 2, \quad 2 \leq z \leq 3$. [10]

Q.7 Evaluate the integral $\int_0^\infty \int_0^\infty e^{-(x^2+y^2)}\ dx\ dy$ by changing into polar co-ordinates. [10]

PART – C

Q.1 Find the surface and the volume of the spindle shaped solid formed by revolving the asteroid $x^{\frac{2}{3}} + y^{\frac{2}{3}} = a^{\frac{2}{3}}$ about x – axis. [20]

Q.2 Find the Fourier series for the function $f(x) = x + x^2$ for $-\pi < x < \pi$ [20]

Hence deduce $\frac{\pi^2}{6} = 1 + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \cdots$

and $\frac{\pi^2}{12} = 1 - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \cdots$

Q.3 Using Lagrange's multiplier method to obtain the extreme points of the function [20]

$$f(x, y, z) = x + y + z$$

Subject to $x^2 + y^2 + z^2 = 1$

Find whether the extreme points are maxima or minima.

Q.4 Verify Gauss' divergence theorem, given that [20]

$$\bar{F} = 4xz\,\hat{i} - y^2\,\hat{j} + yz\,\hat{k}$$

and S is the surface of the cube bounded by the planes

$x = 0,\ x = 1,\ y = 0,\ y = 1,\ z = 0$ and $z = 1$

Q.5 Evaluate the integral by changing the order of integration [20]

$$\int_0^1 \int_0^{\sqrt{2-x^2}} \frac{x}{\sqrt{x^2+y^2}}\,dx\,dy$$

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Roll No. _____ Total No of Pages: 4

11502

B. Tech. I - Sem. (Main) Exam., Dec. - 2018

BSC

1FY2 – 02 Engineering Physics

Time: 3 Hours **Maximum Marks: 160**

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 10 × 3 marks = 30 marks. All ten questions are compulsory.

Part – B: Analytical/Problem solving questions 5 × 10 marks = 50 marks. Candidates have to answer five questions out of seven.

Part – C: Descriptive/Analytical/Problem Solving questions 4 ×20 marks = 80 marks. Candidates have to answer four questions out of five.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART - A

Q.1 Explain, why the surface of a soap bubble illuminated with white light exhibits many colours? [3]

Q.2 Explain, Rayleigh criterion of resolving power. [3]

Q.3 Explain, the physical significance of wave function φ [3]

Q.4 What do you mean by coherence of light? [3]

Q.5 What do you mean by Numerical Aperture of an optical fiber? [3]

Q.6 What are active medium, population inversion and pumping in reference to laser action? [3]

Q.7 Describe in brief the formation of energy bands in solids. [3]

Q.8 What are "Hall effect" and "Hall field"? [3]

Q.9 Explain the displacement current. [3]

Q.10 What do you mean by divergence and curl in reference to the static fields? [3]

PART – B

Q.1 Prove that the square of diameter of black fringe is proportional to the natural number in case of newton's rings. Why do we obtain a dark center at the newton's rings? [7+3=10]

Q.2 A grating is made of 200 wires per cm placed at equal distance apart. The diameter of each wire is 0.025 mm. Calculate the angle of diffraction for third order spectrum if the wavelength of light used is 6000 A°. Also find the absent spectra, if any. [7+3=10]

Q.3 The wave function of a particle in the ground state in one dimensional box of length L is given by $\varphi = \sqrt{\frac{2}{L}} \sin \frac{\pi x}{L}$. Calculate probability of finding the particle within an interval of 1A° at the center of the box of length L=10A° [10]

Q.4 In Michelson interferometer experiment with He-Ne laser of wavelength $\lambda = 11.5\times10^{-7}$ m., fringes are visible up to path difference spread 8 m. Determine the lower limits of the followings: [2+2+2+2+2=10]

(i) Coherence length

(ii) Coherence time

(iii) Spectral line width

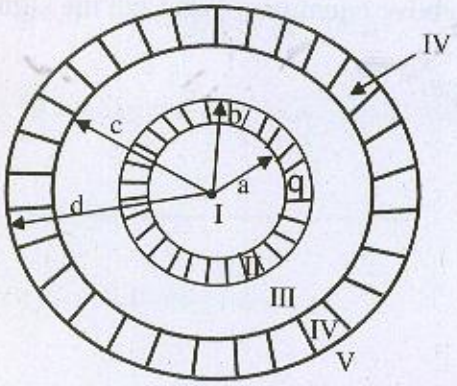
(iv) Quality factor and

(v) Band width.

Q.5 What are the essential requirements for laser action? Derive the relation for Einstein's coefficients "A" and "B", when stimulated emission dominates on the other process. [3+7=10]

Q.6 Explain the term 'mobility of charge carriers' and determine the current density in the sample of n-type semiconductor whose Hall coefficient is = 0.0125 m^3C^{-1} and an electric field of 100 V/m is applied on it (assume $\mu_n = 0.36\ m^2v^{-1}s^{-1}$). [3+7=10]

Q.7 Consider two concentric uniformly charged spherical shell with inner and outer radii 'a', 'b', 'c' and 'd' as shown in the following figure. Both the shells carry equal amount of positive charge Q. Find the electric field in different regions. [10]



PART – C

Q.1 Describe the principle, construction, theory and working of Michelson interferometer to determine the wavelength and difference in the wavelength of a given light. [2+4+5+5+4=20]

Q.2 Derive Schrodinger equation for a particle trapped in an infinitely deep cubical potential well of side 'a'. Derive an expression for its energy eigen values. What is degeneracy of second excited state? What shall happen to above degeneracy if the well is a rectangular parallelepiped with sides $a=b \neq c$? [12+4+4=20]

Q.3 Discuss with suitable and neat diagrams the principle, construction and working of Helium-Neon laser. Describe the various applications of lasers in engineering and medical sciences. [4+5+5+6=20]

Q.4 Derive an expression for the electrical conductivity of an intrinsic semiconductor. Why the electrical conductivity of an intrinsic semiconductor does increases with rise in temperature? Mention a device where this property is used. [12+6+2=20]

Q.5 What are Maxwell's equations? Derive differential form of Maxwell's equations. Discuss integral of the above equations. What are the significance of these equations to electricity and magnetism? [4+8+4+4=20]

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Roll No. _____ Total No of Pages: 4

11503

B. Tech. I - Sem. (Main) Exam., Dec. - 2018

BSC

1FY2 – 03 Engineering Chemistry

Time: 3 Hours **Maximum Marks: 160**

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 10 × 3 marks = 30 marks. All ten questions are compulsory.

Part – B: Analytical/Problem solving questions 5 × 10 marks = 50 marks. Candidates have to answer five questions out of seven.

Part – C: Descriptive/Analytical/Problem Solving questions 4 ×20 marks = 80 marks. Candidates have to answer four questions out of five.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

Q.1 What is hardness of water? How many types of hardness in water define with reaction? [3]

Q.2 Define Calorific Value? Distinguish between gross and net calorific value. [3]

Q.3 Write short note on Octane number. [3]

Q.4 What do you mean by degree of hardness? [3]

Q.5 Explain the method of sedimentation in water purifying. [3]

Q.6 What is the role of gypsum in cement? [3]

Q.7 Explain the importance of annealing process in glass manufacturing. [3]

Q.8 Write the properties and uses of Aspirin? [3]

Q.9 Write the steps of Elimination reaction mechanism with examples? [3]

Q.10 Write short note on Extreme pressure Lubrication? [3]

PART - B

Q.1 Explain the Zeolite method of water softening in detail with regeneration process. [10]

Q.2 Explain the Otto-Hoffmann by product oven method in brief with diagram. [10]

Q.3 Explain the meaning of Tinning in corrosion control. [10]

Q.4 Write short note on-

(a) Flash and fire point [5]

(b) Safety glass [5]

Q.5 Explain SN1 reaction with examples. [10]

Q.6 Write short note on Break Point Chlorination. [10]

Q.7 Explain the manufacturing of glass with diagram. [10]

PART - C

Q.1 (a) What is the unit of hardness? How is it determined by EDTA method with reaction? [2+8=10]

(b) A water sample was analyzed. The following data was obtained. [10]

$Ca(HCO_3)_2 = 40.5$ ppm, $Mg(HCO_3)_2 = 36.5$ ppm, $CaSO_4 = 34.0$ ppm, $MgSO_4 = 30.0$ ppm, $CaCl_2 = 27.75$ ppm, $KCl = 10.0$ ppm. Calculate the amount of lime (90% Pure) and soda (95% Pure) required for treatment of 30,000 litres of water.

Q.2 (a) Explain the determination of calorific value of solid fuel using Bomb Calorimeter. [8]

(b) A sample of Coal was found to have the following percentage composition by weight: C = 90%, O = 3.0%, S = 0.5% N = 0.5% and ash = 2.5% [12]

Calculate:

(i) The minimum amount of O_2 and air by weight necessary for complete combustion of 1 kg of Coal.

(ii) Weight of air required if 40% excess of air is supplied.

(iii) Gross and net calorific value of coal sample using Dulong's formula.

Q.3 (a) What are the functions of Lubricant? How are they classified? [12]

(b) Write note on Cloud and Pour point. [8]

Q.4 (a) What are the different type of organic reactions? Explain them with examples. [10]

(b) What do you mean by Markovnikov's Rule? Discuss addition electrophilic and free radical addition reaction in alkenes. [2+8=10]

Q.5 Write short note on following-

(a) Caustic Embrittlement [5]

(b) Synthetic petrol [5]

(c) Refining of gasoline [5]

(d) Emulsification [5]

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11504

B. Tech. I - Sem. (Main) Exam., Dec. - 2018

HMSC

1FY2 – 04 Communication Skills

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 5 × 2 marks = 10 marks. All five questions are compulsory.

Part – B: Analytical/Problem solving questions 4 × 10 marks = 40 marks. Candidates have to answer four questions out of six.

Part – C: Descriptive/Analytical/Problem Solving questions 2 × 15 marks = 30 marks. Candidates have to answer two questions out of three.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART - A

Q.1 Define Diagonal Communication. [2]

Q.2 What do you mean by Correlative Conjunction? Explain with example. [2]

Q.3 Why do we write Curriculum Vitae? [2]

Q.4 What is the moral of the story 'How much Land does a Man Need?' written by Leo Tolstoy? [2]

Q.5 Write the central theme of the poem 'If' written by Rudyard Kipling. [2]

PART – B

Q.6 Justify the statement – 'Effective communication is the key to organizational success.' [10]

Q.7 What do you understand by the term 'Interpersonal Communication'? What will you do to achieve an Effective Interpersonal Communication? [3+7=10]

Q.8 (a) Change the Voice of the following: [1×2=2]

(i) What do you want?

(ii) Do you know me?

(b) Change the following sentences into Indirect speech: [1×2=2]

(i) The teacher said to the students, "You are careless about your studies."

(ii) He said to me, "Are you fine?"

(c) Supply the appropriate modal verb according to the intended meaning given in brackets: [1×2=2]

(i) .....you take tea? (Invitation)

(ii) Run fast lest you.....miss the bus. (Hypothetical Situation)

(d) Complete the following conditional sentences: [1×2=2]

(i) If you learn driving .....

(ii) They generally play cricket if.....

(e) Combine each of the following sets into one sentences: [1×2=2]

(a) (i) We eat.

(ii) We may live.

(b) (i) He will not spend his money.

(ii) He will not invest it.

Q.9 What is Business Letter writing? What are its various components? Explain with example. [3+7=10]

Q.10 What message does the writer of the story 'Luncheon' want to convey to the readers? Elaborate. [10]

Q.11 'The poem 'No Men are Foreign' has a greater relevance in today's nuclear world than even before.' – Justify this statement. [10]

PART - C

Q.12 What are the various barriers to Communication? How can we eradicate these barriers for effective communication? Describe in details. [7.5+7.5=15]

Q.13 Write a Paragraph on Any One of the following: [15]

(a) Value of Human Values in present Scenario

(b) Depression among Youth

(c) Role of Education in the institution of Family

Q.14 Write a critical appreciation of the poem 'Where the mind is without Fear'. [15]

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Roll No. _____ Total No of Pages: 4

11505

B. Tech. I - Sem. (Main) Exam., Dec. - 2018

HMSC

1FY2 – 05 Human Values

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 5 × 2 marks = 10 marks. All five questions are compulsory.

Part – B: Analytical/Problem solving questions 4 × 10 marks = 40 marks. Candidates have to answer four questions out of six.

Part – C: Descriptive/Analytical/Problem Solving questions 2 × 15 marks = 30 marks. Candidates have to answer two questions out of three.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART - A

Q.1 Self Exploration [2]

Q.2 Prosperity [2]

Q.3 Respect [2]

Q.4 Natural Acceptance [2]

Q.5 Existence as Coexistence [2]

PART - B

Q.1 "The need of self is qualitative whereas the need of body is Quantitative". Distinguish the needs of Self and Body with the help of examples. [10]

Q.2 What so you mean by Animal Consciousness and Human Consciousness? Explain it with the help of diagram. [10]

Q.3 "Being in Harmony is Happiness". Explain the statement with the help of real life example. [10]

Q.4 Values are the core of all the relationships. Explain the foundation value and the complete value to justify the statement. [10]

Q.5 "Right Understanding is the basis of Harmony in the family which leads to the harmony in the Society". Comment on the statement. [10]

Q.6 What is Harmony in Nature? Why is it important? Explain it with suitable example. [10]

PART – C

Q.1 Explain the meaning of Right Understanding, Right Relationship and Physical Facilities. What is the correct order of these three things for fulfilling the human aspirations? Give the detailed diagram. [15]

Q.2 "Today our desire, thoughts and expectations are governed by pre-conditioning and sensation which is the real cause of the problems". Illustrate the statement. [15]

Q.3 Solve the given case: [15]

Air pollution in India is estimated to kill 1.5 million people every year and also responsible for many health problems. In Nov 2017, Delhi became the most polluted city on Earth and breathing in the Indian capital this month was like smoking 50 cigarettes a day. Hospitals reported a 20 percent surge in patients with pollution – related illnesses, and doctors have declared a public health emergency. The air pollution status in Delhi has undergone many changes in terms of the levels of pollutants, its effects on health and control measures taken to reduce them.

Vehicular emissions and industrial activities were found to be associated with indoor as well as outdoor air pollution in Delhi. In fact, much of the pollution is coming from farms in nearby states of Punjab, Haryana and Western Uttar Pradesh. With the rice harvest over, farmers are burning crop stubble – specifically the remnants of the rice crop to prepare the fields to plant wheat and return nutrients to the soil. NASA's Suomi NPP satellite was also able to capture the crop fires in India and Pakistan creating a plume of gray haze.

Studies on air pollution and mortality from Delhi found that all – natural – cause mortality and morbidity increased with increased air pollution. And the government has failed to find ways to control the well – understood sources of pollution, which has allowed the situation to grow progressively worse over time. Delhi has taken several steps to reduce the level of air pollution in the city during the last 10 year. However, more still needs to be done to further reduce the levels of air pollution. This is third year

in a row that air pollution in Delhi has become very severe, despite the Indian Supreme Court's attempt to mitigate it with a fireworks sales ban ahead of Diwali, the festival of lights.

1. What are the main reasons of Delhi Air Pollution?
2. How ignorance of Human Values is increasing the problem of pollution year after year in Delhi?
3. What can be the possible solutions for the problem according to the Value Education?

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11506

B. Tech. I - Sem. (Main) Exam., Dec. - 2018

ESC

1FY3 – 06 Programming for Problem Solving

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 5 ×2 marks = 10 marks. All five questions are compulsory.

Part – B: Analytical/Problem solving questions 4 ×10 marks = 40 marks. Candidates have to answer four questions out of six.

Part – C: Descriptive/Analytical/Problem Solving questions 2 ×15 marks = 30 marks. Candidates have to answer two questions out of three.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART - A

Q.1 Explain the concept of Arrays in C. [2]

Q.2 What is a pseudo code? [2]

Q.3 Give 4 examples of secondary memory. [2]

Q.4 Convert $(37A)_{16}$ into octal number system. [2]

Q.5 Add 3475 and 2057 in octal number system. [2]

PART - B

Q.1 Calculate 9's compliment of 74895. [10]

Q.2 Subtract $(7657)_8$ from $(863C)_{16}$. [10]

Q.3 Draw a flow chart to add 2 numbers written as $\left(\frac{a}{b}\right)$ and $\left(\frac{c}{d}\right)$. [10]

Q.4 State the differences between Assembly and Machine languages. [10]

Q.5 Explain the difference between structure and union with suitable examples. [10]

Q.6 What do you understand by Multifile handling? Give a suitable example. [10]

PART - C

Q.1 Explain the differences among direct, sequential and random access methods. [15]

Q.2 Write a program to add the contents of 2 arrays using pointer. [15]

Q.3 (a) Add 101101110 and 01100011. [15]

(b) Subtract 100001111 from 1011110000.

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11507

B. Tech. I - Sem. (Main) Exam., Dec. - 2018

ESC

1FY3 – 07 Basic Mechanical Engineering

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 5 × 2 marks = 10 marks. All five questions are compulsory.

Part – B: Analytical/Problem solving questions 4 × 10 marks = 40 marks. Candidates have to answer four questions out of six.

Part – C: Descriptive/Analytical/Problem Solving questions 2 × 15 marks = 30 marks. Candidates have to answer two questions out of three.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART - A

Q.1 Define Mechanical energy and Thermal energy. [2]

Q.2 What are the basic functional differences between Refrigeration and Air Conditioning System? [2]

Q.3 Define Impulse Turbine and Reaction Turbine. [2]

Q.4 Differentiate between Soldering and Brazing. [2]

Q.5 Compare High Carbon Steal with High Speed Steel. [2]

PART – B

Q.1 What are the types of power plants? Explain and also enlist the name of power plant located in Rajasthan? [10]

Q.2 Explain the parameters by which I.C. engines are classified. [10]

Q.3 Derive the expression of tension ratio $\left(\frac{T_1}{T_2}=e^{\mu\theta}\right)$ for the belt drive where T_1 and T_2 are tight and slack side tension respectively, μ is coefficient of friction and θ is the angle of lap. [10]

Q.4 Explain the following psychometric terms – [10]

(i) Dry Bulb Temperature

(ii) Wet Bulb Temperature

(iii) Dew Point Temperature

(iv) Relative Humidity

(v) Degree of Saturation

Q.5 In a constant speed compression ignition engine operating on four stroke cycle and fitted a brake, the following observations were taken – [10]

Brake wheel diameter (D) = 60.5 cm, speed (N) = 450 rpm, load on band (w) = 21 kgf (206.01N), Spring balance reading (s) = 3 kgf (29.43N), Bore (d) = 10 cm, Stroke (L) = 15 cm, Mean Effective Pressure (Pm) = 7.3 kgf/cm^2 (716.13 kPa). Determine the BHP, IHP and mechanical efficiency.

Q.6 Explain the principle of arc welding. List the various equipments and tools used in arc welding. [10]

PART – C

Q.1 (a) Describe the construction and working of reciprocating pump with neat sketches. [5]

(b) Compare the S.I. engines with C.I. engines. [5]

(c) Explain the various types of engineering material's properties. [5]

Q.2 Explain the following manufacturing processes in detail:

(i) Forging [3]

(ii) Rolling [3]

(iii) Extrusion [3]

(iv) Casting [3]

(v) Drawing [3]

Q.3 (a) Derive the expression for the length of belt of the following – [10]

(i) For open belt drive

(ii) For crossed belt drive

(b) How the steam boilers are classified? Give the examples of each. [5]

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Roll No. _____ Total No of Pages: 4

11508

B. Tech. I - Sem. (Main) Exam., Dec. - 2018

ESC

1FY3 – 08 Basic Electrical Engineering

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 5 × 2 marks = 10 marks. All five questions are compulsory.

Part – B: Analytical/Problem solving questions 4 × 10 marks = 40 marks. Candidates have to answer four questions out of six.

Part – C: Descriptive/Analytical/Problem Solving questions 2 × 15 marks = 30 marks. Candidates have to answer two questions out of three.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART - A

Q.1 [2]

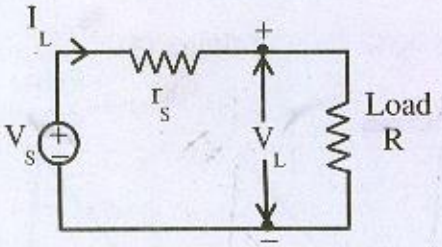


Figure - (1)

For the circuit of figure – (1), V_S = 12 Volt, r_S = 0.3 ohm and load current (I_L) = 10 Ampere. Calculate total power supplied by the practical source.

Q.2 Define bandwidth of series resonance circuit. [2]

Q.3 Describe Hysteresis and eddy current loss formulae for transformer. [2]

Q.4 Draw torque-slip characteristic of induction motor for combinations of rotor resistance and leakage reactance. [2]

Q.5 Among which parameters output characteristic of common base bipolar junction transistor is drawn? Name the three distinct regions of this characteristic. [2]

PART - B

Q.1

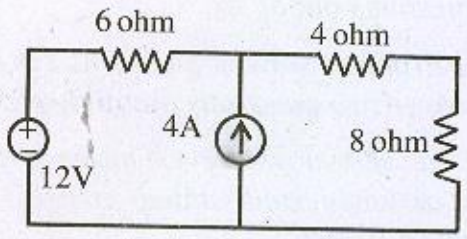


Figure - (2)

Determine the current in the 8 ohm resistor in the circuit of figure-2 by superposition theorem. [10]

Q.2 Find the rms value of the wave form of figure (3). [10]

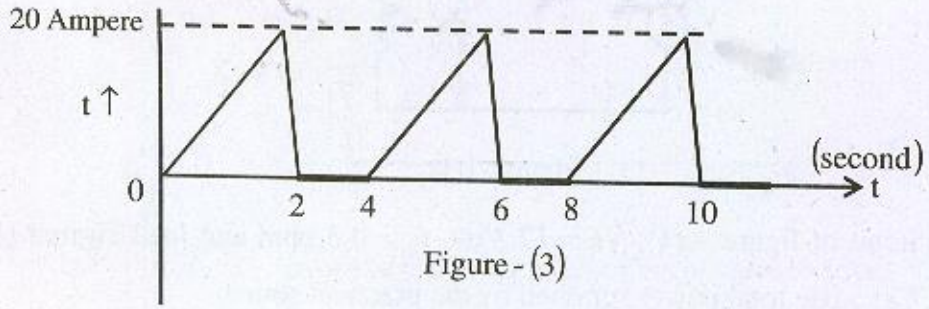


Figure - (3)

Q.3 A single phase transformer has primary voltage of 230 Volt. No-load primary current is 5 Ampere. No-load power factor is 0.25. Number of primary turns is 200 and frequency is 50 Hz.

Calculate:

(i) Maximum value of flux in the core [4]

(ii) Core loss [3]

(iii) Magnetizing current [3]

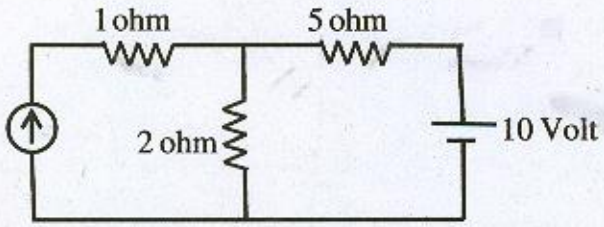
Q.4 Describe torque-speed characteristic of separately excited DC motor and also explain how the speed control of this motor is done. [10]

Q.5 Describe the basic circuit of single-phase rectifier with R load and DC-DC converter. [10]

Q.6 Describe the pipe and plate earthing types with neatly drawing diagrams. [10]

PART – C

Q.1 (a) By mesh analysis, find the current through 2 ohm resistor in the circuit of figure (4). [9]



(b) Describe regulation and efficiency of transformer. [6]

Q.2 (a) A voltage of 150 Volt, 50 Hz is applied to a coil of negligible resistance and inductance 0.2 Henry. Write the time equation for voltage and current. [9]

(b) Describe the working of synchronous generator explaining its principle. [6]

Q.3 (a) What is meant by power transistor? Explain it in detail and also describe IGBT with their applications. [9]

(b) Describe any of pipe and plate earthing types drawing neat diagram. [6]

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B. Tech. I - Sem. (Main) Exam., Dec. - 2018

ESC

1FY3 – 09 Basic Civil Engineering

Time: 2 Hours **Maximum Marks: 80**

Min. Passing Marks: 26

Instructions to Candidates:

Part – A: Short answer questions (up to 25 words) 5 × 2 marks = 10 marks. All five questions are compulsory.

Part – B: Analytical/Problem solving questions 4 × 10 marks = 40 marks. Candidates have to answer four questions out of six.

Part – C: Descriptive/Analytical/Problem Solving questions 2 × 15 marks = 30 marks. Candidates have to answer two questions out of three.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART - A

Q.1 Define Civil Engineer? [2]

Q.2 Differentiate between fore bearing and back bearing. [2]

Q.3 Differentiate between floor area and carpet area. [2]

Q.4 What is transportation and what are its needs? [2]

Q.5 Define the term Biodiversity. [2]

PART – B

Q.1 Discuss the role of a civil engineer in the society. [10]

Q.2 Discuss various types of levelling instruments with their relative merits & demerits. [10]

Q.3 Explain the term 'foundation'. Enumerate the various types of building foundation. [10]

Q.4 Explain in detail various modes of transportation with their characteristics. [10]

Q.5 List out various types of chain used in linear measurement and discuss in detail metric chains. [10]

Q.6 What are the various types of solid wastes? Write a short note on solid waste management. [10]

PART – C

Q.1 Define Air pollution. What are the various air pollutants? Write down the harmful effects of air pollution and its abatement. [15]

Q.2 Explain various components of building along with their functions. [15]

Q.3 What are the various causes of accidents? Discuss various road safety measure in detail. [15]
