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18105

B. Tech. I - Sem. UD (Main / Back) Exam., Jan. - 2020

IFY1 – 05 Human Values

Admitted Batch: 2018 – 19 & 2019 - 20

Time: 3 Hours **Maximum Marks: 100**

Min. Passing Marks: 33

Instructions to Candidates:

PART - A** : Short answer questions (up to 25 words) 10 × 2 marks = **20 marks.
*All **ten** questions are compulsory.*

***PART - B** : Analytical/Problem Solving questions (up to 100 words) 6×5 marks=**30 marks**.*
*Candidates have to answer **six** questions out of **eight.***

PART - C** : Descriptive/Analytical/Problem Solving questions 5×10 marks =**50 marks.
*Candidates have to answer **five** questions out of **seven.***

1. NIL 2. NIL

PART – A

Q.1 What do you mean by moral values?

Q.2 Differentiate between wealth and prosperity.

Q.3 What does right understanding mean?

Q.4 How can a person be happy?

Q.5 What is the importance of justice in our life?

Q.6 Why do we need to know ourself?

Q.7 What does the proposal I = body signify?

Q.8 What is the comprehensive human goal?

Q.9 What do you mean by good life?

Q.10 Why is holistic technology required?

PART – B

Q.1 How can you say that natural acceptance is same for all of us?

Q.2 The four orders in nature are interconnected and mutually fulfilling. Discuss.

Q.3 Discuss the problems we face today due to preconditioned desires thoughts and selections.

Q.4 Briefly explain the programs needed to achieve the comprehensive human goal.

Q.5 Explain the feelings of care, guidance, glory and gratitude.

Q.6 The units are in co – existence being in space. Discuss.

Q.7 How does human consciousness differ from animal consciousness?

Q.8 Developing ethical competence in individuals is the only effective way to ensure professional ethics. Discuss.

PART – C

Q.1 Discuss the need for value education in technical institutes.

Q.2 Explain self – exploration as the process of value education.

Q.3 Activities of imaging (desire), analysing (thought) and selecting/tasting (expectation) are constantly taking place in 'I'. Discuss.

Q.4 Family is the basic unit of human interaction. Explain.

Q.5 Discuss the broad holistic criteria for the evaluation of technologies, production systems and management models.

Q.6 Respect of a human being is based on the evaluation on the basis of 'I'. Discuss.

Q.7 How does the feeling of Sanyam facilitate the correct appraisal of our physical needs. Discuss.

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B. Tech. I - Sem. UD (Main / Back) Exam., Jan. - 2020
IFY2 – 02 Engineering Physics
Admitted Batch: 2018 – 19 & 2019 - 20

Time: 3 Hours **Maximum Marks: 100**

Min. Passing Marks: 33

Instructions to Candidates:

PART - A** : Short answer questions (up to 25 words) 10 × 2 marks = **20 marks.
*All **ten** questions are compulsory.*

PART - B** : Analytical/Problem Solving questions (up to 100 words) 6×5 marks=**30 marks.
*Candidates have to answer **six** questions out of **eight.***

PART - C** : Descriptive/Analytical/Problem Solving questions 5×10 marks =**50 marks.
*Candidates have to answer **five** questions out of **seven.***

1. NIL 2. NIL

PART – A

Q.1 What is Newton's ring?

Q.2 State Bragg's law.

Q.3 What is wave function?

Q.4 State Heisenberg's uncertainty principle.

Q.5 Write two applications of optical fibers.

Q.6 What is Coherence?

Q.7 What is a 'LASER'?

Q.8 What is population inversion?

Q.9 Define the terms: Valence band and Conduction band.

Q.10 State Faraday's Law.

PART – B

Q.1 Describe Fraunhofer's diffraction due to a single slit and deduce the positions of maxima and minima.

Q.2 What do you understand by resolution? Explain the resolving power of a telescope.

Q.3 Derive Schrodinger's time independent wave equation.

Q.4 Calculate the permitted energy levels of an electron in a box 1 Å wide.

Q.5 The refractive index of core of an optical fibre is n_1=1.45 and the relative refractive index difference is 0.01. Find maximum angle of acceptance for this fibre.

Q.6 Prove that in high frequency region laser action is not possible.

Q.7 What do you mean by an intrinsic semiconductor? Can it behave as an insulator?

Q.8 What is Biot-Savart law? Discuss its application.

PART – C

Q.1 A parallel beam of light of two wavelength 6000Å and 6000.5Å falls normally on a diffraction grating 10 mm wide. At a certain diffraction angle θ these lines are close to be being resolved. Find θ.

Q.2 Write down the Schrodinger's equation for a particle enclosed in one dimensional box of size 'a'. Solve it for eigen values and eigen functions.

Q.3 What do you mean by spatial and temporal coherence for propagating waves? Show the visibility is measure of degree of coherence.

Q.4 Describe the construction and working of He-Ne Laser.

Q.5 What is Hall Effect? Give an elementary theory of Hall Effect. Obtain the expression for Hall coefficient in terms of Hall voltage.

Q.6 Derive Maxwell's equations from the basic laws of electromagnetism.

Q.7 Write short notes on-

(a) Poynting Vector

(b) Laplace's and Poisson's equations.

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B. Tech. I - Sem. UD (Main / Back) Exam., Jan. - 2020

IFY2 – 01 Engineering Mathematics - I

Admitted Batch: 2018 – 19 & 2019 - 20

Time: 3 Hours **Maximum Marks: 100**

Min. Passing Marks: 33

Instructions to Candidates:

PART - A** : Short answer questions (up to 25 words) 10 × 2 marks = **20 marks.

*All **ten** questions are compulsory.*

***PART - B** : Analytical/Problem Solving questions (up to 100 words) 6×5 marks=**30 marks**.*

*Candidates have to answer **six** questions out of **eight.***

PART - C** : Descriptive/Analytical/Problem Solving questions 5×10 marks =**50 marks.

*Candidates have to answer **five** questions out of **seven.***

1. NIL 2. NIL

PART – A

Q.1 What are the value of integral $\int_0^\infty e^{-x^2}\, dx$?

Q.2 Write the formula for surface area of solid of revolution when the revolution is about y – axis.

Q.3 Show the sequence $\{x_n\}$, where $x_n = \frac{2n-7}{3n+23}$ converges to $\frac{2}{3}$.

Q.4 Find the value of a_0 for the function $f(x) = |x|$ in the interval $(-\pi, \pi)$.

Q.5 Show that $\lim_{(x,y)\to(0,0)} \frac{2x-y}{x^2+y^2}$ does not exist.

Q.6 State the necessary and sufficient condition for the minimum of a functions f(x, y).

Q.7 If $u = e^{xyz}$, find $\frac{\partial^2 u}{\partial y\, \partial z}$.

Q.8 Evaluate $\int_0^b \int_0^x xy\, dxdy$.

Q.9 State the Gauss divergence theorem.

Q.10 If $\vec{F} = xy^2\hat{i} + 2x^2yz\hat{j} - 3yz^2\hat{k}$, find div $\vec{F}$ at the point (1, - 1, 1).

PART – B

Q.1 Examine the convergence of the series $u_n = \frac{\sqrt{n}}{3n-1}$.

Q.2 Let $f(x,y) = \begin{cases} \frac{x^3-y^3}{x^2-y^2}, & (x,y) \neq (0,0) \\ 0, & (x,y) = (0,0) \end{cases}$,

then show that the function f is not differentiable at the origin.

Q.3 Find the Fourier series for the function $f(x) = x, \quad -\pi < x < \pi$.

Q.4 State Euler's theorem and if $u = \tan^{-1}\left(\frac{x^3+y^3}{x-y}\right)$, then prove that -

$$x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} = \sin 2u.$$

Q.5 Find the points where the function $x^3 + y^3 - 3axy$ has maximum or minimum value.

Q.6 Evaluate $\int_0^\infty \int_x^\infty \frac{e^{-y}}{y}\, dxdy$ by changing the order of integration.

Q.7 If $\vec{r} = x\hat{i} + y\hat{i} + z\hat{k}$ and $r = |\vec{r}|$, then prove that -

$$\text{div}\, r^n\vec{r} = (n+3)\, r^n.$$

Hence, show that $r^n\vec{r}$ will be solenoidal if $n = -3$.

Q.8 Prove that equation:

$$\int_0^{\pi/2} \frac{d\theta}{\sqrt{(a\cos^4\theta + b\sin^4\theta)}} = \frac{\left\{\Gamma\frac{1}{4}\right\}^2}{4(ab)^{\frac{1}{4}}\sqrt{x}}$$

PART – C

Q.1 Use beta and gamma functions, to evaluate -

(a) $\int_0^\infty \frac{x}{1+x^6}\, dx$

(b) $\int_0^1 \sqrt{\left(\frac{1-x}{x}\right)}\, dx$

Q.2 Test the convergence of the series:

$$1 + \frac{1}{2}x + \frac{1.3}{2.4}x^2 + \frac{1.3.5}{2.4.6}x^3 + \ldots\ldots$$

Q.3 Find the Fourier series for the function $f(x) = x \sin x$, $-\pi < x < \pi$ and deduce that :

$$\frac{\pi}{4} = \frac{1}{2} + \frac{1}{1.3} - \frac{1}{3.5} + \ldots\ldots$$

Q.4 If $u = f(r)$, where $r^2 = x^2 + y^2$, then prove that -

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = f''(r) + \frac{1}{r}f'(r)$$

Q.5 Evaluate $\int_0^a \int_0^{\sqrt{a^2-x^2}} y^2\sqrt{x^2+y^2}\, dxdy$ by changing into polar coordinates.

Q.6 Evaluate $\int_0^{\log 2} \int_0^x \int_0^{x+\log y} e^{x+y+z}\, dxdydz$

Q.7 Verify Stoke's theorem for the vector function $\vec{F} = x^2\hat{i} + xy\hat{j}$, where C is the perimeter of the square in xy – plane whose sides are along the lines $x = 0$, $y = 0$, $x = a$ and $y = a$.

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B. Tech. I - Sem. UD (Main) Exam., Jan. - 2020

IFY2 – 03 Engineering Chemistry

Time: 3 Hours

Maximum Marks: 100
Min. Passing Marks: 33

Instructions to Candidates:

PART - A** : Short answer questions (up to 25 words) 10 × 2 marks* ***20 marks.
*All **ten** questions are compulsory.*

PART - B** : Analytical Problem Solving questions (up to 100 words) 6×5 marks* ***30 marks.
*Candidates have to answer **six** questions out of **eight.***

PART - C** : Descriptive/Analytical Problem Solving questions 5×10 marks* ***50 marks.
*Candidates have to answer **five** questions out of **seven.***

1. NIL

2. NIL

PART – A

Q.1 How are exhausted ion – exchange resins regenerated?

Q.2 What happens when temporary hard water is boiled? Give equations.

Q.3 What is power alcohol?

Q.4 What is sweetening of petrol?

Q.5 What is chemical formula of rust?

Q.6 The rate of metallic corrosion increases with increase in temperature. Give reason.

Q.7 Write the formula and uses of Paracetamol.

Q.8 Write the formula with percentage of borosilicate glass.

Q.9 Define Emulsification.

Q.10 Write the components with percentage of Portland cement.

PART – B

Q.1 How calorific value of a gaseous fuel is determined by Junker's calorimeter.

Q.2 What are the requirements of boiler feed water?

Q.3 Define cloud and pour points and how it is determined in laboratory?

Q.4 Explain the mechanism of free radical substitution reaction with suitable example.

Q.5 Explain role of gypsum in cement manufacturing.

Q.6 Differentiate between chemical corrosion and electrochemical corrosion.

Q.7 Write short notes on –

(a) Galvanic corrosion

(b) Breakpoint chlorination

Q.8 What is the significance of octane number and cetane number and for which these are used. How these can be improved?

PART – C

Q.1 0.72gm of a fuel containing 80% carbon, when burnt in a Bomb calorimeter, increased the temperature of water from 27.3° C to 29.1° C. If the calorimeter contains 250 gms of water and its water equivalent is 150 gms, calculate the HVC of fuel. Answer is calculated in kJ/kg.

Q.2 A water sample on analysis give following data –

Ca^{+2} = 30mg/L; Mg^{+2} = 24mg/L; CO_2 = 24mg/L; HCl = 50mg/L; K^+ = 10mg/L;

Calculate the quantity of lime (90% pure) and soda (94% pure) required to soften one million liters of water sample.

Q.3 Define cement and explain its manufacturing by R.K. method with chemical reaction and neat diagram.

Q.4 Explain scale formation and slug formation in boilers. How are they removed?

Q.5 Write short notes on any two –

(a) Refining of gasoline

(b) Characteristics of a good fuel

(c) Metallurgical coke

Q.6 (a) How is corrosion prevented by cathodic protection? Explain.

(b) Explain Pitting corrosion

Q.7 (a) Explain thick and thin layer mechanism of lubrication.

(b) Explain general chemistry of different types of glass.

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Total No of Pages: 3

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B. Tech. I - Sem. UD (Main / Back) Exam., Jan. - 2020

IFY1 – 04 Communication Skills

Admitted Batch: 2018 – 19 & 2019 - 20

Time: 3 Hours

Maximum Marks: 100

Min. Passing Marks: 33

Instructions to Candidates:

PART - A** : Short answer questions (up to 25 words) 10 × 2 marks = **20 marks.
*All **ten** questions are compulsory.*

PART - B** : Analytical/Problem Solving questions (up to 100 words) 6×5 marks=**30 marks.
*Candidates have to answer **six** questions out of **eight.***

PART - C** : Descriptive/Analytical/Problem Solving questions 5×10 marks =**50 marks.
*Candidates have to answer **five** questions out of **seven.***

1. NIL 2. NIL

PART – A

Q.1 Define Communication Skills.

Q.2 What are the various channels of Communication?

Q.3 List two reasons why Communication skills are important for you.

Q.4 Define Conjunctions.

Q.5 Name any two differences between Interpersonal and Intrapersonal Communication.

Q.6 What do you know about Conditional Sentences?

Q.7 Give the full form of CV?

Q.8 Give the names of the various parts of a Business Letter?

Q.9 Name the author of the Short Story: "Luncheon".

Q.10 Name the poet who wrote the poem "No Men are Foreign".

PART – B

Q.1 Discuss the various aspects of Corporate Communication.

Q.2 What do you know about Verbal and Non – Verbal Communication? Explain giving suitable examples.

Q.3 Fill in the blanks –

(i) When Tom was 16, he was a fast runner. He ..... run 200 meters in 22 seconds?

(a) can (b) could

(c) can't (d) couldn't

(ii) I'm afraid I ..... come to your party next Saturday.

(a) can (b) could

(c) can't (d) couldn't

(iii) I'm not in a hurry. I've got plenty of time. I ..... wait.

(a) can (b) could

(c) can't (d) couldn't

(iv) This is a very precious book. You ..... lose it.

(a) must (b) mustn't

(c) needn't (d) couldn't

(v) This is a very great novel. You ..... read it.

(a) must (b) mustn't

(c) needn't (d) couldn't

Q.4 What is paragraph writing? Give suggestions for writing a good paragraph.

Q.5 Give a short summary of "Luncheon".

Q.6 What is the central idea of the poem "If" by Rudyard Kipling?

Q.7 Make the following sentences passive –

(i) The cleaning lady is cleaning the floors now.

(ii) Millions of people speak English all over the world.

(iii) Where do people grow rice?

(iv) The French make Renault cars.

(v) Somebody has robbed me.

Q.8 Infosys, New Delhi has given an advertisement in 'The Hindustan Times' for recruitment of trainees for their company. Apply for the same, giving your detailed curriculum vitae. Invent all necessary details.

PART – C

Q.1 What are the Barriers to Communication? Describe the methods for overcoming the barriers to communication.

Q.2 What are the qualities of Good Communication?

Q.3 Describe the Reported Speech, suggesting rules for the conversion of Direct Speech into Indirect Speech with apt examples.

Q.4 Describe the main events in the short story "The Night Train at Deoli".

Q.5 Give a gist of "Where the Mind is Without Fear" by Rabindranath Tagore.

Q.6 Write a letter to the Editor of a Newspaper complaining about the frequent breakdown of electricity in your locality.

Q.7 Write a report on the ban imposed on plastic bags and how you could make it more successful.
