

1ST SEM./ Common to all Branches / 2020(W)NEW
TH1-A Communicative English

Full Marks: 80

Time- 3 Hrs

Answer all Questions
 Figures in the right hand margin indicate marks

		Answer All questions	
Q.1.		Read the following passage carefully and do as directed. Khairi's story started on October 5, 1974 when 12 Kharia tribals of Similipal brought a two-month old tiger cub to Saroj Raj Chaudhury, an officer in Indian Forest Service, Saroj noticed that it was a female – famished and confused. His first experience what was to become his passion of life was angry snarls and scratching claws. But, the veteran forester and the instinctive lover of wild life knew how to handle a hungry and angry cub. He imitated the sound of a mother tigress. "Within minutes her confidence was firmly anchored in the fostering human," is how he recalled those first few minutes between the legends. At that time, he was an authority on the tiger and Director of Project Tiger in India. Saroj introduced the Tiger Tracing Method of tiger census where the pug marks of each animal with distinctive measurements and characteristics are meticulously recorded. He was also a member of World Wildlife Fund during lifetime.	
	A.	Answer the followings briefly:	
	i.	When and how Khairi was brought to Mr. Chaudhury?	02
	ii.	How Khairi was behaving at that time?	02
	iii.	How did Saroj manage the cub?	02
	iv.	Make a brief analysis of Saroj Raj Chaudhury's contribution.	02
	B.	Find the words from the passage which have the following meanings:	
	i.	Very hungry	02
	ii.	A strong liking	02
	C.	Make sentences using the following words on your own (any one):	
		i. Confuse ii. Handle	02
	E.	Supply single word substitute to: Having operations in several countries	02
	D.	Make a note of the above passage.	04
Q.2.		Answer the followings:	
	i.	Give a description of narrator's final encounter with Red.	02

	ii.	What are the different characteristics of a good team player?	02
	iii.	Describe the Inchcape Rock.	02
	iv.	What makes the poet address her friend “extra-special”?	02
	v.	Why Rover was punished?	02
Q.3.		Do as directed.	
	A.	Fill-in the blanks with appropriate choices given in the brackets.	
	i.	It ____ not happen this way. (may, can)	02
	ii.	There is a temple ____ the river. (besides, beside)	02
	iii.	The club ____ of nine members. (consist, consists)	02
	B.	Change the voice.	
	i.	He loves junk food.	02
	ii.	Do not pluck the flowers.	02
Q.4.	A.	Write a paragraph in about 120 words on any one of the following topics: i. My Institute ii. Energy crisis	05
	B.	Answer any one of the followings: i. You have lost your I Card in institute premises. Draft a notice. ii. Write a report on Tree Plantation Programme conducted in your institute.	05
	C.	Answer any two of the followings: i. You have come back to hostel after a long stay at home during lock down. Now you miss your mother. Draft a letter to her. ii. You are B Sports House, Badadanda, Puri. You have received a packet of torn track suits from your distributor Bombaywalla, Bajrakabati Road, Cuttack. Draft a letter of complaint. iii. You could not attend your sessional exam as you had fever. Now you are fine. Draft an application to your H.O.D. to allow you a chance.	05 X 2
	D.	Shakti Software, Sector-6, Rorkela has invited applications for the post of Maintenance Engineer from diploma holders in Electronics and Telecommunication Engineering. (i) Apply for the post and (ii) enclose your C.V. or Bio-data.	05 + 05
Q.5.		Answer any two of the followings: i. Attempt a discussion on importance of gestures and postures in non-verbal communication. ii. How many types of space you know? Discuss them. iii. Communication follows a dynamic cycle. Explain with help of suitable diagram.	05 X 2

1ST SEM ./COMMON TO ALL BRANCHES/ 2020(W) NEW

TH1-B Computer Application

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2

Figures in the right-hand margin indicate marks

1.	Answer All questions	2 x 10
a.	Define pointer in C programming language.	
b.	What is variable in C programming language?	
c.	What is ALU	
d.	What do you mean by non-impact printer?	
e.	Define compiler.	
f.	What do you understand about protocol? Give two examples of protocol	
g.	Define URL with example?	
h.	Compare between file and folder.	
i.	Define GUI .	
j.	Define NULL character constant and NULL statement in C programming language	
2.	Answer Any Six Questions	6 x 5
a.	Compare between 3 rd generation and 4 th generation of computers	
b.	Give a brief description on Email.	
c.	Draw a flow chart to add all the natural numbers from 100 to 200.	
d.	Write about different types of computer virus.	
e.	Discuss about system software and application software	
f.	Explain about different types of mode of data transmission based on direction of data flow.	
g.	Define looping? Write the details about three types of basic looping used in C programming language	
3	Draw a flow chart and write a program in C to add all digits of a given number.	10
4	Define file access? Write on various types of file access methods.	10
5	Write on memory hierarchy system?	10
6	Define topology? Explain various types of topology used to form a network.	10
7	Define Operating System? Write about various types of operating system used in computer	10

**1ST SEMESTER/ COMMON TO ALL BRANCHES/ 2020(W)NEW
TH-2A ENGINEERING PHYSICS**

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. Name the basic units in S.I system.
 - b. Define dot product of 02 vectors.
 - c. What is Dynamic friction?
 - d. Mention the relationship between (i) Linear & Angular velocity (ii) Linear & Angular acceleration
 - e. Define Universal Gravitational Constant (G).
 - f. How are velocity, frequency and time period of a wave related ?
 - g. Define Specific Heat of a substance.
 - h. What is Refractive Index? State its unit.
 - i. Define Unit Charge.
 - j. What does LASER stand for?
 2. Answer **Any Six** Questions 5 x 6
 - a. Check the dimensional correctness of the physical relations
(i) $s = 6ut + 8at^2$ (ii) $v^2 - u^2 = 9as$ (2.5+2.5)
 - b. At what angle 02 forces (A+B) and (A-B) should be inclined to have a resultant $\sqrt{3A^2 + B^2}$
 - c. What are different methods of reducing friction ?
 - d. Explain the variation of acceleration due to gravity (g) with
(i) Altitude (ii) Depth (2.5+2.5)
 - e. Explain "Critical Angle" and "Total Internal reflection" with ray diagram
 - f. The effective capacitance of 02 capacitors is 4 μF when connected in series and 18 μF when connected in parallel. Find the capacitance of each capacitor.
 - g. State & explain Coulomb's Law in Magnetism. (2 + 3)
- ANSWER ANY THREE QUESTIONS**
3. Derive formulae for (i) Time of flight (T) (ii) Maximum Height attained (iii) Maximum Horizontal Range of a projectile fired at an angle θ with horizontal. 10
(3+4+3)
 4. Obtain equations for (i) Displacement (ii) Velocity (iii) Acceleration of a body executing Simple Harmonic Motion (SHM) 10
(3+4+3)
 5. Prove that $\alpha : \beta : \gamma = 1 : 2 : 3$ where α, β and γ are co-efficients of linear, areal and cubical expansion of solid material. 10
 6. Establish the condition of balance in a wheatstone bridge using Kirchoff's law with a clear circuit diagram. 10
 7. State Faraday's laws of electromagnetic induction. Compare Fleming's Left Hand Rule and Right Hand Rule. 10
(5+5)

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
 Figures in the right hand margin indicates marks

Answer **All** questions.

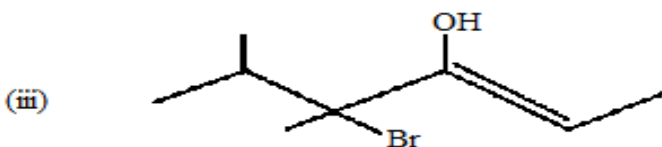
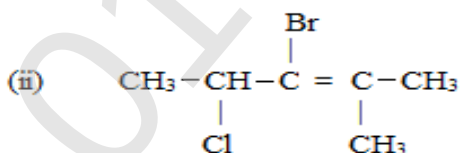
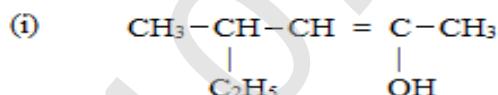
2 x 10

1. a. What do you mean by 'penultimate shell'? what is the maximum capacity of this shell to hold electrons?
- b. What are basic salts? Give an example of it.
- c. What happens in the reduction step of metallurgical operation?
- d. Give the bond-line formula of 3-Methylpent-2-ene.
- e. Which chemical substances are responsible for the temporary hardness of water?
- f. Write down the electronic configurations of Cu and Fe^{3+} ion.
- g. What is the major component of CNG? Give one use of CNG.
- h. Name the monomers of Bakelite.
- i. Define insecticides. Give example of an insecticide.
- j. What are lubricants? Give an example of solid lubricant.

2. Answer **Any Six** Questions

6 x 5

- a. Define P^{H} of a solution. How many grams of NaOH are required to prepare 2 litres of its solution having P^{H} 12?
- b. Explain electrolysis of aqueous solution of NaCl.
- c. Explain magnetic separation method of concentration of ores with a neat and labelled diagram.
- d. Define hardness of water. Explain cold-lime soda process of removal of hardness of water.
- e. Write a brief note on preparation and uses of Bakelite.
- f. Define and explain Arrhenius theory of acids and bases. What is neutralization reaction?
- g. Write down the IUPAC names/structural formulae of the following.



(iv) 4-Bromo-3-methylpent-3-en-2-ol

(v) 2-Methylbuta-1,3-diene

3	(a) Briefly explain 'Bohr's atomic model' for hydrogen atom.	06
	(b) How many grams of $\text{Ca}(\text{OH})_2$ are required to prepare 2.5 litres of its decinormal solution?	04
4	(a) What are lubricants? Write down the purpose of lubrication.	06
	(b) Define herbicide and fungicide with at least two examples from each.	04
5	(a) Write down the composition and uses of producer gas.	05
	(b) Give a brief note on 'Galvanization'.	05
6	(a) Define Faraday's 1 st law of electrolysis. How many grams of silver will be deposited by the passage of 50 ampere of current through silver nitrate solution of 30 minutes?	05
	(b) Define covalent bonding. Explain the formation of CH_4 molecule.	05
7	(a) Define and explain vulcanisation of raw rubber.	05
	(b) Distinguish between saturated and unsaturated hydrocarbons.	05

TH-3 ENGINEERING MATHEMATICS-I

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
 Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. Find the value of $\frac{\sin 15 + \cos 15}{\cos 15 - \sin 15}$
 - b. Find the value of $\tan^{-1} \left(2 \cos \frac{\pi}{3} \right)$
 - c. The maximum value of $\begin{vmatrix} \sin^2 x & \sin x \cos x \\ -\cos x & \sin x \end{vmatrix}$
 - d. Find the value of k if the lines $2x - 3y + 7 = 0$ and $x - ky + 2 = 0$ are perpendicular to each other.
 - e. If $A = \begin{pmatrix} 2 & 4 \\ 3 & 13 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 5 \\ 2 & -2 \end{pmatrix}$, then find the value of $A - 2B$
 - f. Find centre and radius of sphere $x^2 + y^2 + z^2 - 2x - 2y - 2z - 1 = 0$
 - g. If the distance between the points $(-1, -1, z)$ and $(1, -1, 1)$ is 2, then find the value of z
 - h. Find the image of the point $(3, -1, 5)$ with respect to XY - Plane
 - i. Find the direction cosines of a line whose direction ratios are $(1, 1, 1)$
 - j. Find the Value of $\sin 70 (4\cos^2 20 - 3)$
2. Answer **Any Six** Questions 6 x 5
 - a. Solve by Cramer's rule $2x - 3y = 7$ and $3x - 2y = 3$
 - b. Find the equation of circle having centre at $(2, 3)$ and circle passes through the point $(1, 2)$.
 - c. Prove that $\sin 20 \sin 40 \sin 60 \sin 80 = \frac{3}{16}$
 - d. Find angle between the planes $2x + y - 3z + 2 = 0$ and $3x - y + 2z + 3 = 0$
 - e. Find Inverse of the matrix $\begin{pmatrix} 2 & 1 & -2 \\ 1 & 2 & 1 \\ 3 & 6 & 4 \end{pmatrix}$
 - f. If $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \pi$ then prove that $x + y + z = xyz$

- g Find the equation of line passing through the point $(2, -4)$ and parallel to the line $4x + y - 3 = 0$
- 3 Prove that without expanding 10
- $$\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)^3$$
- 4 a Find the equation of line passing through intersection of lines $2x - y - 1 = 0$ and $3x - 4y + 6 = 0$ and parallel to the line $x + y - 2 = 0$ 5
- b Find the value of $\sin^{-1} \frac{1}{\sqrt{5}} + \cos^{-1} \frac{3}{\sqrt{10}}$ 5
- 5 Find the ratio and co-ordinate in which the line segment joining the points $(1, 3, -1)$ and $(2, 6, -2)$ is divided by ZX-Plane 10
- 6 Solve by matrix method 10
- $$x - y + z = 4, 2x + y - 3z = 0, x + y + z = 2$$
- 7 Find the equation of plane passing through the points $(2, -3, 1)$ and $(-1, 1, -7)$ and perpendicular to the plane $x - 2y + 5z + 1 = 0$ 10

Th4. ENGINEERING MECHANICS

Full Marks: 80

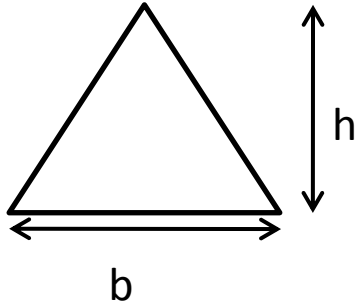
Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. What is resultant force?
 - b. Define couple
 - c. Define lateral strain.
 - d. State varignons theorem?
 - e. Define elasticity
 - f. Define impulse
 - g. What is clockwise and anticlockwise moment?
 - h. State lami's theorem
 - i. What is force . Write down its SI units
 - j. Define coplanar and collinear forces

2. Answer **Any Six** Questions 5 x 6
 - a. Find the magnitude and direction of the resultant of concurrent forces of 8N,10N,12N and 14N making angles of 30° , 60° , 120° , and 145° respectively with positive direction of x-axis.
 - b. State and prove perpendicular axis theorem
 - c. Define M.A, V.R. and efficiency of a simple lifting machine and derive the relationship between them.
 - d. A body of weight of 50N is pulled along a rough horizontal plane by a force of 18N acting on angle of 14° with horizontal. Find the coefficient of friction
 - e. Find the position of centroid of I-section having following dimensions:
Bottom flange = 300mm x 50mm
Top flange = 150mm x 50mm
Web = 300mm x 50mm
 - f. Draw the stress-strain curve for ductile material and explain the salient points on it
 - g. Define amplitude , frequency and time period of simple harmonic motion

- 3 Find out I_{xx} and I_{yy} for the isosceles triangle shown in the figure. 10



- 4 State and prove parallelogram law of forces. 10

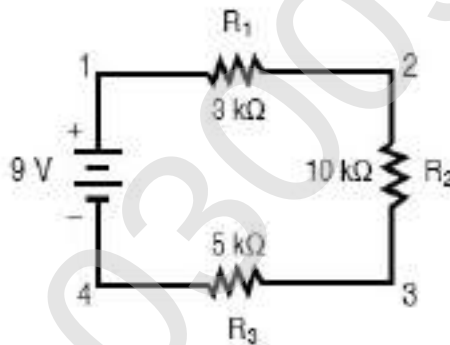
- 5 In a worm and worm wheel, the number of teeth in the worm wheel is 25. The effort handle is 300mm long and the load drum is 150 mm diameter. Find the efficiency of the machine, if an effort of 30N can lift a load of 345N and the worm is double threaded 10

- 6 Find out the velocity and acceleration of a particle executing simple harmonic motion. 10

- 7 A ball of mass 1 kg moving with a velocity of 2m/sec impinges directly on a ball of mass 2kg at rest. The first ball after impinging comes to rest. Find the velocity of the second ball after impact and the coefficient of restitution. 10

Answer any five Questions including Q No.1& 2
 Figures in the right hand margin indicates marks

1. Answer All questions 2 x 10
 - a. State and explain Ohm's Law.
 - b. With a 4 ohm resistor and a 3 ohm capacitance reactance, what is the total impedance?
 - c. What is the function of surge tank in hydroelectric power plant?
 - d. What is the importance of commutator and brush in DC machine?
 - e. Sketch connection diagram of :- (i) Ammeter (ii) Voltmeter
 - f. Define Electronic Emission & classify different types of Emission.
 - g. Draw the circuit diagram of centre tap full wave rectifier & Bridge full wave rectifier.
 - h. Define transducer.
 - i. Write two applications of Multimeter?
 - j. What is Modulation?
2. Answer Any Six Questions 6 x 5
 - a.



Find the current I passing through and the voltage across each of the resistors in the above circuit.

- b. Explain the working of fluorescent lamp.
- c. A building has the following electrical appliances
 - (i) A 1 HP motor running for 5 hrs in a day.
 - (ii) Three fans each of 80W running for 10 hrs. in a day.
 - (iii) Four tube lights of 40W running for 15 hrs. per day.
 Find the monthly bill for the month of November if unit cost of bill is Rs.2.50.
- d. (i) Write short notes on casing and capping wiring.
 (ii) Define PN junction Barrier voltage, depletion region, Junction Capacitance.
- e. Define Oscillator and explain working of basic Oscillator with simple block diagram.
- f. Explain the difference type of modulation.
- g. State the relation between α, β, γ .
3. A 230 V, 50 Hz ac supply is applied to a coil of 0.06 H inductance and 2.5 Ω resistance connected in series with a 6.8 μF capacitor. Calculate (i) Impedance (ii) Current (iii) Phase angle between current and voltage (iv) power factor 10
4. Draw the block diagram of Nuclear Power Plant and explain the function of each elements of it. 10
5. (a) Discuss the torques required in measuring instruments in briefly. 10
 (b) Write difference between Analog and Digital Multimeter?
6. Draw the block diagram of a communication system and explain the function of each block? 10
7. What is CRO? Explain working principle of CRO with simple Block diagram? 10