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B.N.M. Institute of Technology

An Autonomous Institution under VTU

Model Question Paper

Second Semester BE, 2023-24 Scheme

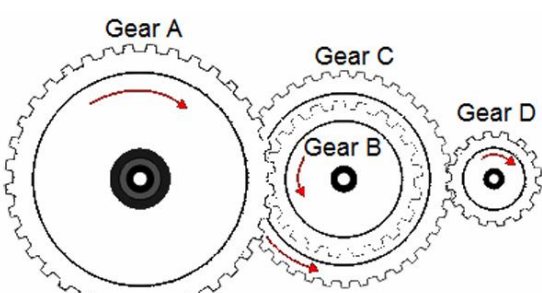
Basic Engineering Sciences – 23BES124

Duration: 3 Hour

Max. Marks: 100

Note: 1. Answer One full question from each Module (5Q x 20M=100 Marks)

Module 1

Q. No	Questions	Marks	CO	PO	Cognitive Level
1 (a)	Discuss the advantages and disadvantages of Solar energy.	6	1	1,2,7	Understand
1 (b)	Describe the construction and working of horizontal axis wind turbine with a neat diagram.	7	1	1,2,7	Apply
1 (c)	<p>In the figure below, Gears B and C represent a compound gear and have the following details: Gear A - 120 teeth, Gear B - 40 teeth, Gear C - 80 teeth, Gear D - 20 teeth. What is the output in rpm at D, and what is the direction of rotation if Gear A rotates in a clockwise direction at 30 rpm?</p> 	7	1	1,2,7	Understand

OR

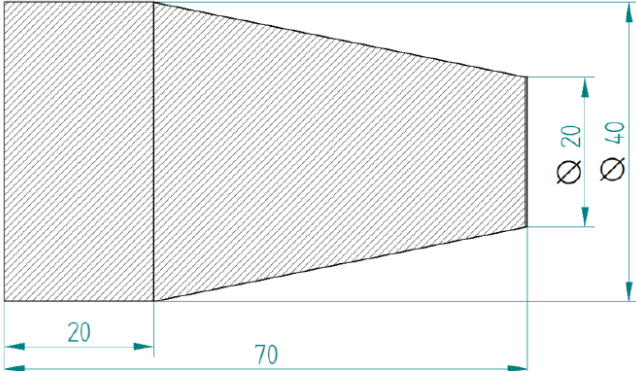
2 (a)	Derive an expression for length of an open belt drive system.	8	1	1,2,7	Apply
2 (b)	In a belt drive the ratio of tensions is 2, and the slack side is 500 N. If the speed and diameter of the driven pulley are 200 rpm and 120 cm respectively, find the power transmitted.	7	1	1,2,7	Apply
2 (c)	Briefly classify the gear trains system.	5	1	1,2,7	Apply

Module 2

3 (a)	Describe any four milling operations with diagrams.	8	2	1,2,5	Apply
3 (b)	Discuss the components and working of CNC machines.	7	2	1,2,5	Understand
3 (c)	With neat sketch explain lathe specifications	5	2	1,2,5	Understand

OR

4 (a)	Write a CNC part program for the profile shown below.	8	2	1,2,5	Apply
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4 (b)	Describe Robot anatomy with a labelled diagram.	6	2	1,2,5	Apply
4 (c)	Discuss the application of end effectors	6	2	1,2,5	Apply
Module 3					
5 (a)	Describe the terminologies used in casting Process with a labelled diagram.	7	3	1,2,5	Apply
5 (b)	Discuss any two defects of casting process.	6	3	1,2,5	Apply
5 (c)	With neat sketch explain Stereo lithography	7	3	1,2,5	Apply
OR					
6 (a)	Explain the principle of electric arc welding with a labelled diagram	8	3	1,2,5	Understand
6 (b)	Discuss the advantages and disadvantages of additive manufacturing process.	6	3	1,2,5	Apply
6 (c)	Describe the types of automation with their merits.	6	3	1,2,5	Understand
Module 4					
7 (a)	Explain the application of Artificial Intelligence in Civil engineering.	6	4	1,2,5	Understand
7 (b)	Explain sand replacement material with advantages and disadvantages.	7	4	1,2,5	Understand
7 (c)	Explain the importance of Geographic Information system (GIS) and Remote sensing	7	4	1,2,5	Understand
OR					
8 (a)	Explain the scope of any four branches of civil engineering.	7	4	1,2,5	Understand
8 (b)	Explain 3D Printed buildings, Pre-engineered buildings (PEB).	6	4	1,2,5	Understand
8 (c)	Briefly explain cement replacement materials	7	4	1,2,5	Understand
Module 5					
9 (a)	State and prove parallelogram law of forces.	6	5	1,2	Apply
9 (b)	find the coplanar concurrent force system shown in the figure	6	5	1,2	Apply

9(c)	<p>Find the magnitude, direction and distance of the resultant from the point 'A' for the system of forces shown in Figure</p>	8	5	1,2	Apply
OR					
10(a)	<p>Determine the support reactions of the overhanging beam shown in Figure.</p>	10	5	1,2	Apply
10(b)	<p>Two spheres each of radius 100 mm and weight 5 kN are in a rectangular box as shown in Figure. Calculate the reactions at all the points of contact</p>	10	5	1,2	Apply