

R16

Code No: 131AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B.Tech I Year I Semester Examinations, December - 2018

ENGINEERING MECHANICS

(Common to CE, EEE, ME, ECE, CSE, EIE, IT, MCT, ETM, MMT, AE, MIE, PTM, CEE, MSNT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) What is triangle law of force? [2]
- b) State and explain Lami's theorem. [3]
- c) What forces are involved in ladder wall application if the wall is rough. [2]
- d) What are the laws of friction? [3]
- e) What does the second theorem of pappus indicate? [2]
- f) Define radius of gyration. [3]
- g) What is the moment of inertia of a sphere? [2]
- h) What is the mass moment of inertia of a hollow cylinder with outer radius, inner radius and length as R, r and L respectively? [3]
- i) What is the principle of conservation of energy? [2]
- j) Explain D'Alembert's principle. [3]

PART - B**(50 Marks)**

- 2.a) What is Newton's first law of motion and law of transmissibility of forces?
- b) Find the magnitude and direction of the resultant force. Also find the position of the resultant force from point P of the bar PS (Figure 1). [5+5]

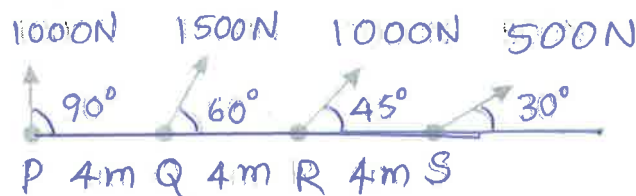


Figure: 1
OR

3. Determine x,y,z, components of 750 N and 900 N and also the angles θ_x , θ_y and θ_z that the force forms with coordinate axes shown in figure 2. [10]

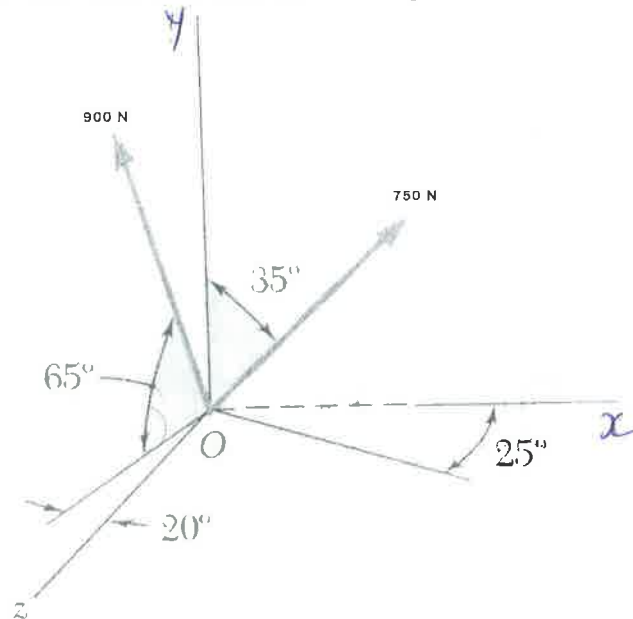


Figure: 2

4. What is the least value of P to cause motion of the system shown in figure 3 towards the right. Also find θ . Assume coefficient of friction to be 0.2. Body A and B weighs 900 N and 650 N respectively. [10]

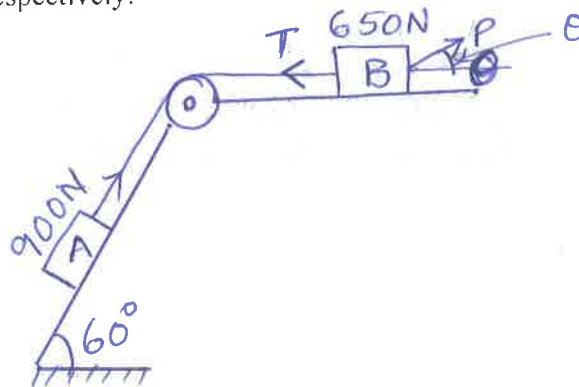


Figure: 3

OR

5. A 12° wedge resting on a horizontal floor supports a block of weight 1200 N as shown in Figure 4. The block is to be raised by applying a horizontal force P to the wedge. Assume coefficient of friction between all contact surfaces to be 0.28. Determine minimum horizontal force applied to the wedge to raise the block. [10]

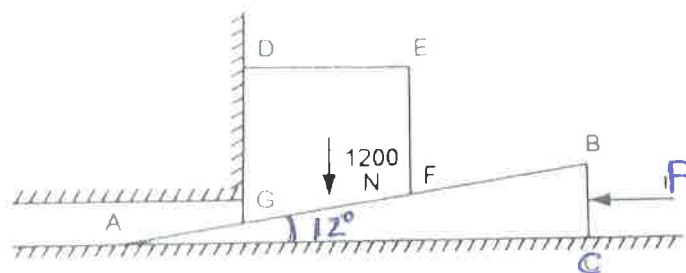


Figure: 4

6. Locate the centroid of the shaded area as shown in Figure 5.

[10]

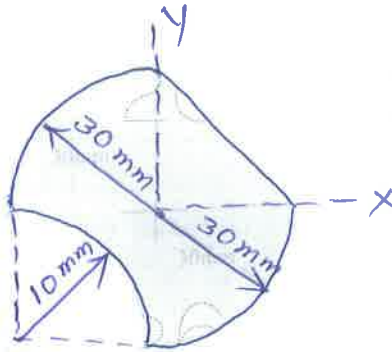


Figure: 5

OR

7. Find the moment of inertia about Y axis of the shaded area under the second degree curve as shown in Figure 6.

[10]

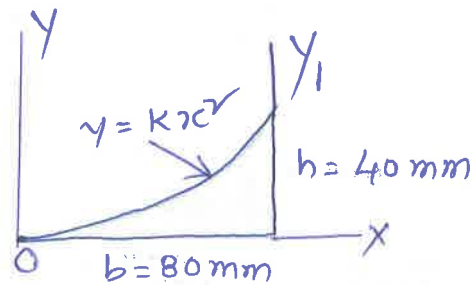


Figure: 6

8. Derive the mass moment of inertia of a cone about its base having radius r and height h .

[10]

OR

9. Determine the radius of gyration in m about the centroidal X axis of the casting as shown in figure 7.

[10]

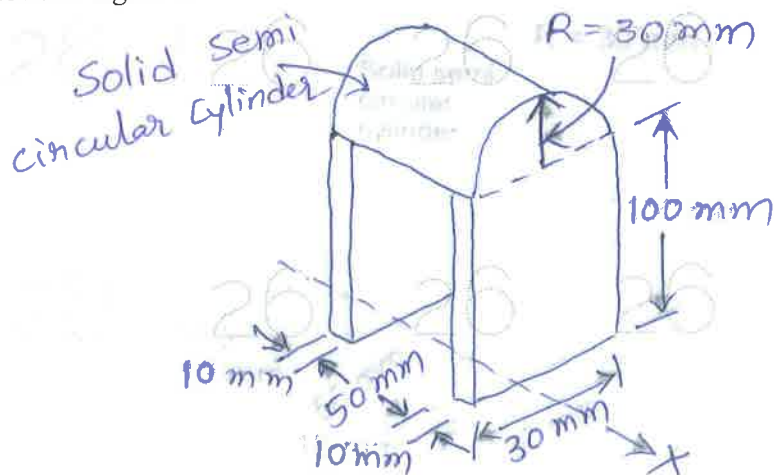


Figure: 7

10. Block A has a weight of 300 N and block B has a weight of 50 N. Determine the speed of block A after it moves 2 m down the plane, starting from the rest (Figure 8). [10]

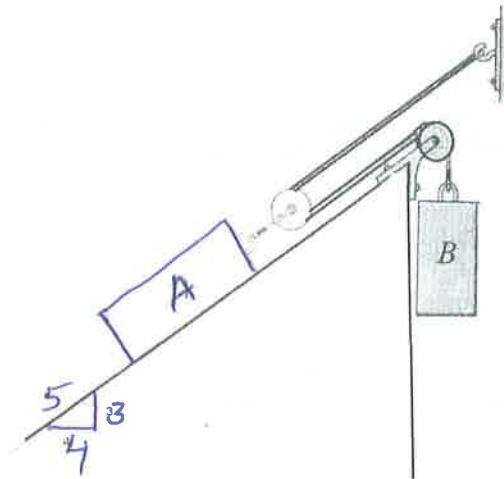


Figure: 8
OR

- 11.a) A train of weight 1800 kN ascends a slope of 1 in 100 with a uniform speed of 40 kmph. If the track resistance is 5 N per kN of superimposed load, find the power spent by the engine.
- b) The double pulley shown in figure 9 has a mass of 3 kg and a radius of gyration of 100 mm. knowing that pulley is at rest, a force of 24 N is applied to cord B, determine the velocity of the centre of the pulley after 1.5 sec and tension in cord C. [5+5]

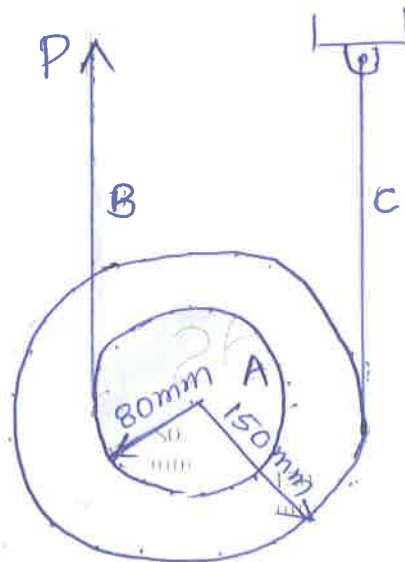


Figure: 9

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD**B.Tech I Year Examinations, December - 2018****ENGLISH****(Common to CE, EEE, ME, ECE, CSE, MIE)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Use the root word/key word given in the bracket and supply the appropriate word to make the sentences meaningful. [2]
- i) Certain information could not be shared under RTI as it is ----- (confidentiality).
- ii) Give me the _____ (correctness) answer, otherwise I will not consider your requisition.
- b) Correct the mistakes, if any, and rewrite the following sentences. [3]
- i) The man in the boat caught three big fishes.
- ii) Sneha works in an university as an Academic Assistant.
- iii) They are going to USA for our summer holidays.
- c) Supply prefix/suffix for the following. [2]
- i) This was a particularly brutal and _____ (coward) act.
- ii) These cars have a reputation for poor _____ (perform).
- d) Correct the mistakes, if any, and rewrite the following sentences. [3]
- i) Dr. John is senior than Rohan.
- ii) The books were distributed between the three students.
- iii) I am ill since three months.
- e) Choose the correct question tag for the sentence given below: [2]
- i) Smart Phones have both advantages and disadvantages, ()
- a) haven't they? b) hasn't they? c) isn't they? d) aren't they?
- ii) You've cleaned your room, _____? ()
- a) haven't you? b) have you? c) did you? d) didn't you?
- f) Correct the mistakes, if any, and rewrite the following sentences. [3]
- i) I have been waiting for you since five hours.
- ii) She has completed the work last month.
- iii) The rich should help poor.
- g) Supply prefix/suffix for the following. [2]
- i) Demands have been more for the _____ (remove) of the Officer from the office.
- ii) They were impressed by the _____ (effective) of the machine.
- h) Fill in the blanks with appropriate prepositions. [3]
- i) We will have completed the work _____ tomorrow.
- ii) I received a tweet _____ the Taj Hotel.
- iii) They were good _____ her.

- i) Fill in the blanks with suitable phrasal verbs with the help of the clue given in the brackets. [2]
 i) We must _____ animals with love and care. (look)
 ii) The cricket match between Australia and India was _____ (call)
- j) Write one – word substitutes for the following descriptions: [3]
 i) Belief that there is only one god.
 ii) No longer used; out of date.
 iii) Rule by a few powerful men.

PART- B

(50 Marks)

- 2.a) How do the women at the tea party behave?
 b) Describe the construction of Krishnarajasagar Dam. [5+5]
- OR**
- 3.a) Write about the social etiquette with reference to "*A Tea Party*".
 b) What is Visvesvaraya's contribution for the growth of Indian economy? [5+5]
- 4.a) Polymer banknotes incorporate many security features. What are they? Explain.
 b) According to Keller, what are the beautiful things in one's life? [5+5]
- OR**
- 5.a) What are the techniques to be followed to describe people/places/events.
 b) Do you get any motivation from the lesson '*Three Days to See*'? Justify. [5+5]
- 6.a) As an engineering student, what kind of risk management you learnt from a fire accident?
 b) Briefly describe the character of Shivashankar in "*Leela's Friend*". [5+5]
- OR**
- 7.a) According to you, what are human values? Explain with examples.
 b) What message do we learn from the story "*The Last Leaf*". [5+5]
8. Prepare a functional resume for the post of a Junior Engineer in Saint Technologies, Mumbai in response to an advertisement. Write cover letter also. [10]
- OR**
9. Write a letter of complaint to the Sales Manager of Vijay Manufacturing Company, Hyderabad about the malfunctioning of Water Filter installed recently. [10]
10. Assuming that you are the In charge of the Central Institute of Environmental Studies, Pune, write a formal report to the Director of the Institute on the problems of air pollution in an urban area of your region. You should make specific recommendations to minimize air pollution. [10]
- OR**
- 11.a) According to Dr. N.R. Narayana Murthy, what is the secret of his success?
 b) What are the advantages of sports and games in life? [5+5]

R09

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B .Tech I Year Examinations, December - 2018

ENGINEERING CHEMISTRY

(Common to CE, EEE, ME, ECE, CSE, EIE, BME, IT, MCT, ETM, MMT, AE, BT, AME, MIE)

Time: 3 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

- 1.a) Define and give expression for specific conductance, equivalent conductance and molar conductance.
b) What is Electro chemical series? Give any three important applications.
c) How do you calculate electrode potential by using Nernst equation? [5+5+5]
- 2.a) Mention about the factors effecting corrosion with reference to nature of metal.
b) Write the characteristics and functions of pigments, drying oils and anti-skinning agents.
c) Give an account on cementation and galvanization. [5+5+5]
- 3.a) What is vulcanization? Why rubber is subjected to vulcanization? Explain the process.
b) Differentiate thermo setting and thermo plastic polymers.
c) Give the preparation and properties of PVC and TEFLON. [5+5+5]
- 4.a) How do you express hardness of water? Discuss about estimation of hardness of water by EDTA method.
b) Describe caustic embrittlement, scales and priming and foaming. How do you prevent them? [8+7]
- 5.a) What are colloids? How are they classified? Mention about optical properties of collides.
b) Give preparation and applications of nano materials.
c) Mention the applications of adsorption. [6+5+4]
- 6.a) Give an account on the advantages and disadvantages of solid fuels over gaseous fuels.
b) Explain Fisher-Tropsch's process.
c) What is combustion? Calculate the amount of air required for the combustion of 1kg coal which is analyzed as C=80%, H=15%, rest oxygen. [4+6+5]
- 7.a) Explain lead-silver system with a neat phase diagram.
b) Explain the concept of metal stable state. [8+7]
- 8.a) What is the criteria of a good lubricant.
b) Describe the manufacturing of portland cement.
c) What are the characteristics of a good refractory? [4+7+4]

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