MALLA REDDY COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF AERONAUTICAL ENGINEERING

II B.TECH I SEMESTER

R15 SUPPLEMENTARY

PREVIOUS QUESTION PAPERS

LIST OF SUBJECTS

CODE	*NAME OF THE SUBJECT*
R15A0067	Technology Management
R15A0363	Mechanics of Solids

Code No: R15A0067

R15

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY

(Autonomous Institution – UGC, Govt. of India)

II B.Tech I Semester Supplementary Examinations, June 2022

Technology Management

(ME & AE)

Roll No										

Time: 3 hours **Max. Marks: 75**

Answer Any **Five** Questions

All Questions carries equal marks.

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1	Discuss the techniques involved in creative problem solving	[15M]
2	Discuss the factors influencing the selection and implementation of R&D strategy.	[15M]
3	How do you measure cost effectiveness of R&D projects?	[15M]
4	What is project selection and how do allocate resources to a product	[15M]
5	What do you mean by Portfolio Planning? Explain its significance features in Research and Development program planning and control.	[15M]
6	How can you develop the alternative to critical raw material?	[15M]
7	List out the various technologies and explain with the suitable examples.	[15M]
8	Explain the stages in Technology Transfer? Identify the factors that determine the absorption capacity of firm?	[15M]

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R15

Code No: **R15A0363**

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II B.Tech I Semester Supplementary Examinations, June 2022

Mechanics of Solids

(AE)

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1 Draw stress-strain curve for Ductile and brittle materials. **[15M]**

2 Two equal washers 15 cm apart are compressed between a rigid horizontal base and a rigid horizontal plate by two equal bolts. The bolts are 30cm apart, arranged symmetrically on either side of washers and collinear with them. Initially each bolt is tightened to a tension of 27kN with an extension of 0.0045cm. If the compression of a washer is four times the extension of a bolt for the same load, determine the increase in tension in one bolt when the other one is further tightened to 36kN. **[15M]**

3 Derive the relation between Shear Force, Bending Moment and rate of loading at a section of a beam. **[15M]**

4 A beam of length 12 m has overhanging of 3 m on left and right leaving the span between the supports of 6 m. It carries UDL of 8 KN/m over the entire length and a concentrated load of 10 KN at the right extreme end. Draw SF and BM diagrams and find the point of contra flexure point **[15M]**

5 A steel cantilever beam 8 m length is subjected to a concentrated load of 32 kN acting at the free end of the bar. The beam is of rectangular cross section, 50mm wide by 100 mm deep. Determine the magnitude and location of the maximum tensile and compressive bending stresses in the beam E=210 Gpa. **[15M]**

6 A rolled steel Joist of I-Section has flange length of 300 mm. 20 mm thick with a web thickness of 20 mm. and overall depth of I-Section is 60 mm. If this beam carries a UDL of 40 KN/m over the simply supported beam of span 10 m, find the maximum stress produced in the beam. **[15M]**

7 At a point in a strained material, the intensities of normal stresses on two planes at right angles to each other are 35 N/mm^2 and 20 N/mm^2 both tensile. They are accompanied by shear stress of 15 N/mm^2(in both x and y direction) . Find the principal planes and principal stresses. Find also maximum shear stress. **[15M]**

8 A cylindrical vessel is 1.5 m diameter and 4 m long is closed at ends by rigid plates. It is subjected to an internal pressure of 3 MPa. If the maximum principal stress is not to exceed 150 MPa, find the thickness of the shell. Also find the changes in diameter, length and volume of the shell. Take Young's modulus = 200 GPa and Poisson's ratio = 0.25. **[15M]**

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