The question setshouldcover the entire syllabus& must be Innovative type for open book system Examination. As examination duration is 2 hours, the answer of any question should not take more than 20 minutes. Question file name should be subject name in full.

SET-I

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Total Number of Pages:	**BTECH/BARCH/MTECH/MCA/MSC**
	Subject Code:BSMA1106
2nd Semester Regular & Back Examination September 2021	
Subject Name: MATHEMATICS-II	
Branch: B.Tech	
Time: 2 Hours	
Max Marks: 60	
Question Code:	
Allthe questionsare compulsory	
The figures in the right-hand margin indicate marks.	
Students are requested to email good quality scanned copy of the Answer Booklet (single PDF file) to your HOD.	

Q1	Solve $(y - y^2x^2 \sin x)dx + xdy = 0$.	**(10)**
Q2	Solve the differential equation by the method of variation $(D^2 - 3D + 2)y = e^x + x$.	**(10)**
Q3	Prove that $P_n(x) = \frac{1}{n!2^n}\frac{d^n}{dx^n}(x^2-1)^n$, where $P_n(x)$ is Legendre polynomial.	**(10)**
Q4	A, B, C can hit a target with probability $\frac{3}{5}, \frac{2}{5}, \frac{3}{4}$ respectively. Determine the probability that (i) two shots hit (ii) at least two shots hit.	**(10)**
Q5	Given that the probability of an accident in an industry is 0.005 and assuming the accidents are independent (a) determine the probability that in any given period of 400 days, there will be an accident one day?(b) What is the probability that there are at most three days with an accident?	**(10)**
Q6	Find the rank correlation for the following data: X: 11.1 10.3 12.0 15.1 13.7 18.5 17.3 14.2 14.8 15.3 Y: 10.9 14.2 13.8 21.5 13.2 21.1 16.4 19.3 17.4 19.0	**(10)**

SET-II

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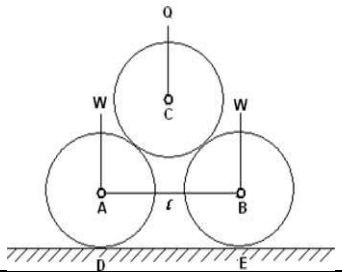
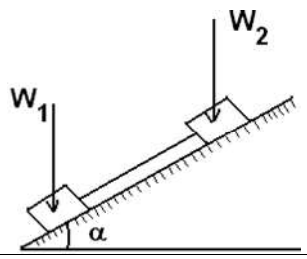
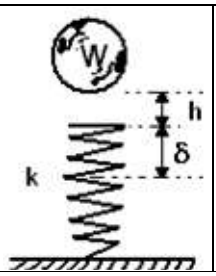
Total Number of Pages: 02	**BTECH**	
	Subject Code: ESME2113	
2nd Semester Regular Examination May 2020		
Subject Name: ENGINEERING MECHANICS		
Branch: MECHANICAL ENGINEERING		
Time: 2 Hours		
Max Marks: 60		
Question Code:		
All the questions are compulsory		
The figures in the right-hand margin indicate marks.		
Students are requested to email good quality scanned copy of the Answer Booklet (single PDF file) to your HOD.		
Q1	(a) State the triangle law of forces and the Lami's theorem. **(b)** Explain the theory of transmissibility of force.	**(10)**
Q2	(a) Define the terms statically determinate, statically indeterminate and redundant support. **(b)** State the assumptions made in the analysis of trusses.	**(10)**
Q3	State and derive Varignon's theorem of moments.	**(10)**
Q4	Two smooth circular cylinders each of weight W = 1000N and radius r = 15 cm., are connected at their centers by a string AB of length l = 40cm., and rest upon a horizontal plane, supporting above them a third cylinder of weight Q = 2000N and radius r =15cm shown in the figure. Find the forces S in the string AB and the pressures produced on the floor at the points of contact D and E. 	**(10)**
Q5	Two blocks of weights W_1 and W_2 rest on a rough inclined plane and are connected by a short piece of string as shown in the fig. If the coefficients of friction are $\mu_1 = 0.2$ and $\mu_2 = 0.2$, respectively. Find the angle of inclination of the plane for which sliding will impend. Assume W1 = W2 = 22.25N. 	**(10)**

Q6	**By conservation of energy method**, find maximum deflection in the spring. If A ball of mass 5 kg is dropped on to a spring of stiffness 500 N/m. From a height of 10cm.		**(10)**