BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: B.TECH **SEMESTER: IV**
BRANCH: PRODUCTION / MECH **SESSION: SP/2020**

SUBJECT: ME207 KINEMATICS AND DYNAMICS OF MACHINES

TIME: 2 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 25.
2. Candidates may attempt for all 25 marks.
3. Before attempting the question paper, be sure that you have got the correct question paper.
4. The missing data, if any, may be assumed suitably.
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

				CO	BL
Q1	(a)	Describe kinematics and kinetics and difference between them.	[2]	1	2,4
Q1	(b)	Sketch and explain Class I, II and III kinematic pairs with the help of degree of freedom also discuss their different forms.	[3]	1	3
Q2	(a)	Discuss the Gruebler's Criterion for degree of freedom of plane mechanism.	[2]	1	2
Q2	(b)	Calculate the degree of freedom of the shown linkage (Figure 1)	[3]	1	4

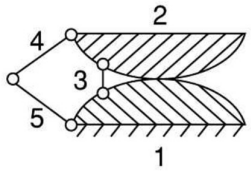

Figure 1

Q3	(a)	Explain Static Equilibrium and write the static equilibrium equations.	[2]	2	2
Q3	(b)	Determine the input torque T on the link OA for the static equilibrium of the mechanism for the given configuration. The slider-crank mechanism with following dimensions is acted upon by a force F=2 kN at B as shown in Figure 2. OA=100 mm, AB =450 mm.	[3]	2	3

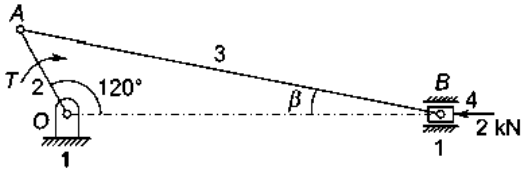

Figure 2

Q4	(a)	Find the expression for maximum fluctuation of energy of a flywheel.	[2]	2	1
Q4	(b)	A flywheel absorbs 24 kJ of energy on increasing its speed of 210 rpm to 214 rpm. Determine its kinetic energy at 250 rpm.	[3]	2	3
Q5	(a)	Define Static balancing.	[2]	3	1
Q5	(b)	Three masses of 8 kg, 12 kg and 15 kg attached at radial distances of 80 mm, 100 mm and 60 mm respectively to a disc on a shaft are in complete balance. Determine the angular positions of the masses of 12 kg and 15 kg relative to the 8-kg mass.	[3]	3	3

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