UNIT–IV

S.No.		Questions	BT	CO	PO
Part – A (Short Answer Questions)					
1		Classify the governors with its function.	L2	CO4	PO1,PO2,PO4
2		Define governor effort.	L2	CO4	PO1,PO2,PO4
3		Define sensitiveness & coefficient of sensitiveness of a governor	L2	CO4	PO1,PO2,PO4
4		Explain the term stability of governor	L2	CO4	PO1,PO2,PO4
5		What is meant by isochronous condition in governors?	L2	CO4	PO1,PO2,PO4
6		Differentiate between governor and flywheel?	L2	CO4	PO1,PO2,PO4
7		Differentiate between the unbalanced force caused due to rotating and reciprocating masses?	L3	CO4	PO1,PO2,PO4
8		Why is only a part of the unbalanced force due to reciprocating masses balanced by revolving mass? (Or) Why complete balancing is not possible in reciprocating engine?	L3	CO4	PO1,PO2,PO4
9		Define tractive force and swaying couple	L2	CO4	PO1,PO2,PO4
10		State the effects hammer blow and swaying couple. and What are the conditions to be satisfied for complete balance of in- line engine?	L2	CO4	PO1,PO2,PO4
Part – B (Long Answer Questions)					
11	a)	Deduce the relation between speed and height of the Porter governor	L2	CO4	PO1,PO2,PO4
	b)	In an engine governor of the Porter type, the upper and lower arms are 200 mm and 250 mm respectively and pivoted on the axis of rotation. The mass of the central load is 15 kg, the mass of each ball is 2 kg and friction of the sleeve together with the resistance of the operating gear is equal to a load of 25 N at the sleeve. If the limiting inclinations of the upper arms to the vertical are 30° and 40°, find, taking friction into account, range of speed of the governor.	L3	CO4	PO1,PO2,PO4

12	a)	Deduce the relation between speed and height of the Proell governor	L2	CO4	PO1,PO2,PO4
	b)	A Proell governor has equal arms of length 300 mm. The upper and lower ends of the arms are pivoted on the axis of the governor. The extension arms of the lower links are each 80 mm long and parallel to the axis when the radii of rotation of the balls are 150 mm and 200 mm. The mass of each ball is 10 kg and the mass of the central load is 100 kg. Determine the range of speed of the governor.	L3	CO4	PO1,PO2,PO4
13		A spring loaded governor of the Hartnell type has arms of equal length. The masses rotate in a circle of 130 mm diameter when the sleeve is in the mid position and the ball arms are vertical. The equilibrium speed for this position is 450 r.p.m., neglecting friction. The maximum sleeve movement is to be 25 mm and the maximum variation of speed taking in account the friction to be 5 per cent of the mid position speed. The mass of the sleeve is 4 kg and the friction may be considered equivalent to 30 N at the sleeve. The power of the governor must be sufficient to overcome the friction by one per cent change of speed either way at mid-position. Determine, neglecting obliquity effect of arms; 1. The value of each rotating mass: 2. The spring stiffness in N/mm; and 3. The initial compression of spring.	L3	CO4	PO1,PO2,PO4
14		In a spring-controlled governor of the Hartung type, the length of the ball and sleeve arms are 80 mm and 120 mm respectively. The total travel of the sleeve is 25 mm. In the mid position, each spring is compressed by 50 mm and the radius of rotation of the mass centres is 140 mm. Each ball has a mass of 4 kg and the spring has a stiffness of 10 kN/m of compression. The equivalent mass of the governor gear at the sleeve is 16 kg. Neglecting the moment due to the revolving masses when the arms are inclined, determine the ratio of the range of speed to the mean speed of the governor. Find, also, the speed in the mid-position.	L3	CO4	PO1,PO2,PO4
15		A rigid motor has all its unbalance in one plane and can be considered to consist of 3 masses m_1=5kg; m_2=3kg at an angle of 165^0 CCW from m_1 & m_3=8kg @ angle 85^0 CW from m_1. The radii r_1=20cm, r_2=8cm & r_3=14cm. Determine the balancing mass required at radius 10cm. Specify the location of this mass with respect to m_1 by using graphical method.	L3	CO4	PO1,PO2,PO4
16		Three masses are attached to a shaft as follows: 10kg@90mm radius; 15kg@120mm radius and 9 kg @ 150mm radius. The	L3	CO4	PO1,PO2,PO4

		masses are to be arranged so that the shaft is in static balance. Determine the angular position of masses relative to 10kg mass by analytical method. All masses are in same plane			