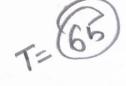
Bihar Engineering University, Patna End Semester Examination - 2022



Course: B. Tech. Code: 102705 Semester: VII
Subject: AUTOMOBILE ENGINEERING.

Time: 03 Hours Full Marks: 70

Instructions:-

- (i) The marks are indicated in the right-hand margin.
- (ii) There are NINE questions in this paper.
- (iii) Attempt FIVE questions in all.
- (iv) Question No. 1 is compulsory

Q.1	Choose the correct	answer of	the following:	(Answer any seve
2	enouse me correct	unsire of	ine jouowing.	Miswel unly se

 $[2 \times 7 = 14]$

- (a) The power to weight ratio of diesel engine compared to petrol engine:
 - I. High
 - II. Low
 - III. Same
 - IV. Not comparable
- (b) A universal joint allows the propellor shaft to
 - I. Change inclination
 - II. Change length
 - III. Bend side ways
 - IV. Transfer torque at an angle
- (c) Camber should generally lie in the range
 - I. Less than 1 degree
 - II. Between 1 and 2 degree
 - MI. Between 2 and 4 degree
 - IV. Around 7 to 8 degree
- (d) The torque converter uses _____ to transfer torque.
 - I. Air
 - M. Automatic transmission fluid (ATF)
 - III. Gears
 - IV. Steel belt
- (e) The function of anti-lock brake system (ABS) is that is
 - I. Reduce the stopping distance
 - II. Minimise the brake fade
 - II. Maintains directional control during braking by preventing the wheels from locking
 - IV. Prevents nose dive during braking and thereby postpones locking of the wheels
- (f) The component that connects the steering rack to the knuckles is
 - I. Tie-rod
 - II. Sector gear
 - III. Pivot
 - IV. Spline
- (g) The process of supplying the intake air to the engine cylinder at a density greater than the density of the surrounding atmosphere is known as
 - J. Supercharging
 - II. Scavenging
 - III. Polymerization
 - IV. Detonation
- (h) In a single dry plate clutch, torsional vibrations are absorbed by
 - I. Coil springs known as torsional springs
 - II. Cushion springs
 - III. Central hub
 - IV. Clutch pedal

	(i)	The chassis in which engine is mounted completely inside the driver's cabin is called I. Conventional control chassis II. Semi-forward control chassis	
	(j)	IV. None of the above The aspect ratio (expressed in percentage) of the tyre is defined as the ratio of Section height to section width II. Wheel diameter to section height	
		III. Wheel diameter to section width IV. Section width to section height	
Q.2	(a)	Differentiate between transistor-based coil ignition system and capacitive discharge ignition	[7] on
Q.3	(a) (b)	Sketch and explain the working of an electromagnetic clutch in an automobile.	[7] [7] [7]
Q.4	(a) (b)	What are the factors to be considered for the design of an ignition system? What are the	he 7]
		16:1. The engine uses a single-jet carburettor having a fuel orifice are of 2 sq. mm and the tip the jet is 5 mm above the level of petrol in the float chamber, when the engine is not runnin Calculate the depression in the venture throat to maintain the required fuel flow rate through the carburettor. Assume specific gravity of petrol as 0.75 and the coefficient of discharge of the fuel orifice as 0.8. What area of venture throat will be required to maintain desired flow rate? Densi of air is 1.20 kg/m³ and the coefficient of discharge for venture throat is 0.8. Negle	of ig. he iel
		communication in the second se	7]
Q.5	(a) (b)	What is the series in 1 C 1 1 C	its 7] 7]
Q.6	(a) (b)	What are the main constituents of exhaust emissions from diesel engines? Give the possible route of their formation.	es 7]
Q.7	(a) (b)	Provide the Control of the Control o	7] 7] cc 00
		 (ii) the brake thermal efficiency; (iii) the air standard efficiency (γ = 1.4); (iv) A/F ratio by weight. Assume volumetric efficiency of 80% 1 kg of petrol vapour = 0.26 m³ at 1.03322 kgf/cm² and 15^{ct} 	0
Q.8	(a)	R = 29.27 kgf/kg-K. [7] Discuss the necessity of using a thermostat valve in the engine cooling system. Explain the construction and working of any type of thermostat valve. [7]	e
	(b)	Explain briefly full flow and partial flow lubricating system with diagram. Indicate their merits.	ir
Q.9	(a)	What is biodiesel? Explain various processes involved in transesterification process to convervegetable oil into biodiesel.	rt
	(b)	What are hybrid vehicles? With the help of a schematic diagram, explain the working of any hybrid electric auto-vehicle.	y