

IIPUC EXAMINATION-2022

SCHEME OF EVALUATION SUBJECT: - AUTOMOBILE (63NS)

NO OF QUESTIONS:-43

NO OF PAGES:-12

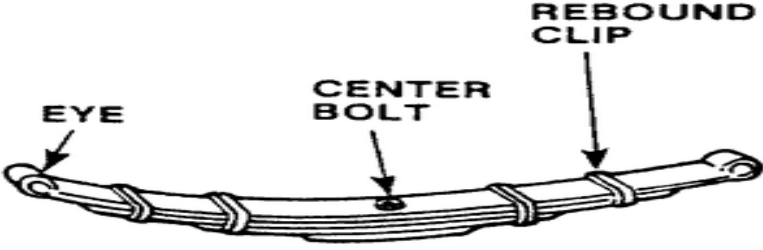
MAX MARKS:60

PART-A

Q.NO	ANSWERS	MARKS
A	CHOOSE THE CORRECT ANSWER	10x1=10
1)	a) Manufacturer	1
2)	d) a, b and c	1
3)	b) Hardware	1
4)	a) Speed	1
5)	c) 30%	1
6)	a) Gearbox and differential	1
7)	b) Spring	1
8)	a) Maximum	1
9)	a) Fuse box	1
10)	c) Resistance	1

	<u>PART-B</u>		
B	ANSWER THE FOLLOWING QUESTIONS (ANSWER ANY 10)		10x2=20
11)	The manufacturers develops service manual which gives clear cut ideas of their product, like material used specification, service limit, span life of component, storage life and sequences to overhaul etc.		2
12)	<p><u>Bolts</u></p> <ul style="list-style-type: none"> Automotive bolts often known as threaded fasteners is one of the types of auto fasteners. The bolts are inserted through holes in assembled parts and fastened by a mated nut. A bolt is an externally threaded headed fastener. 	<p><u>Studs</u></p> <ul style="list-style-type: none"> Studs are mechanical fasteners which are threaded on one or both ends. One end is secured to an object. The other end is used typically with a nut. Automotive studs are commonly referred to as a double ended automobile fastener. 	<p>1</p> <p>1</p> <p>(Any 2 each)</p>
13)	connecting rod bolts, wheel bolts, hub bolts, U-bolts, J-bolts, engine mounting bolts, suspension links and bolts, lug bolts, radiator bolts, motor mount bolts and all mounting plates bolts etc.		2
14)	An odometer is an instrument that indicates distance traveled by a vehicle, such as a bicycle or automobile. <u>The device is helpful to know the distance covered between two destinations.</u>		2

15)	<u>A protractor is a device for measuring the angle between two intersecting lines.</u> The angle is measured in degrees, and a circle is defined as having 360 degrees of identical size.	2
16)	Valve mechanism are classified as given below 1. Overhead valve mechanism (OHV) 2. Overhead Cam mechanism (OHC)	1 1
17)	A poppet valve is a valve typically used to control the timing and quantity of gas or vapour flow into an engine.	2
18)	Cooling is necessary because high temperature damages engine components and changes the viscosity of lubricants. The cooling system protects the engine components by circulating coolant through the passages provided in cylinder block, cylinder head.	2
19)	Compression ring withstands for more pressure and temperature. Compression ring expands and contract during compression and exhaust stroke.	1 1
20)	A differential is a device employing gears, capable of transmitting torque and rotation through three shafts. It transfers the power while in turning to the respective wheels. It consist crown gear, sun gear and star gear.	2
21)	A spring shackle is a device found on leaf-spring equipped vehicles. The spring shackle mounts to one end of the leaf spring and allows it to flex and move while keeping the tire on the road. Without a shackle, the spring would not be able to move.	2

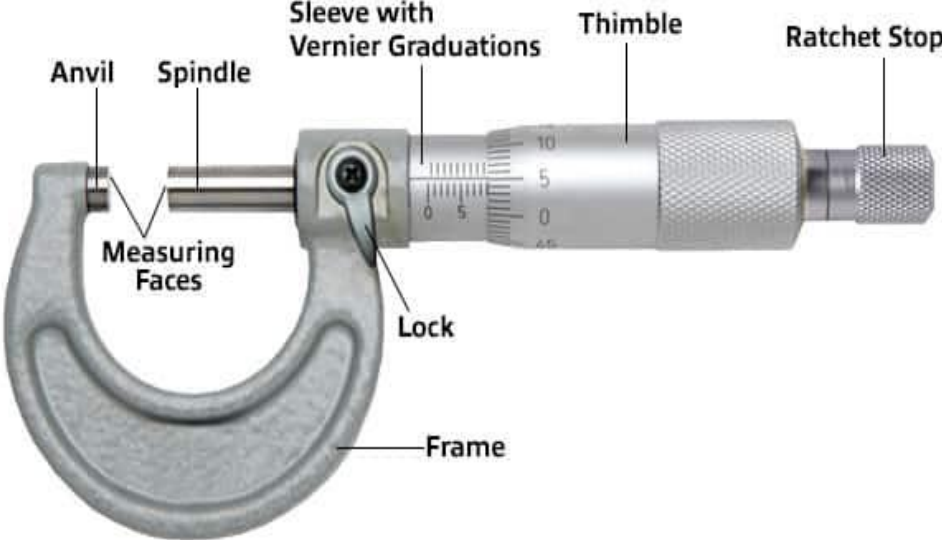
22)	 <p style="text-align: center;">Fig-Leaf spring</p>	2
23)	<p>Automobile cables can be classified into three main categories :</p> <ol style="list-style-type: none"> 1. Starting system cables 2. General purpose cables 3. High-tension cables. <p style="text-align: center;">Or</p> <ol style="list-style-type: none"> 1. Brown Cables 2. Yellow Cables 3. White Cables 4. Green Cables 5. Blue Cables 	1 1
24)	<p>A Multimeter is an electrical test meter capable of measuring</p> <ul style="list-style-type: none"> • Voltage • Resistance (in Ohms) • Current Flow (in ampere) 	2
25)	<p>The Battery is the Heart of the Automotive Electrical System. The battery must be in good useable condition for the rest of the electrical system to function correctly.</p>	2

	<u>PART-C</u>		
C	ANSWER THE FOLLOWING (ANSWER ANY SIX)		6x3=18
26)	<ul style="list-style-type: none"> • Index • Page number • Expanded view of assembly • Disassembly sequence • Tolerances, gazes, sizes of components • Serviceability • Life span • Decision for Repair or Replacement • Assembly procedure and • Working test procedure 		1/2 1/2 1/2 1/2 1/2 1/2 1/2 (Any 6)
27)	A fastener is a hardware device that mechanically joins or affixes two or more objects together. Example: bolts, nuts, screw, stud, rivets, shims, pin, tie rods etc		3
28)	1. Linear measurement		1
	2. Angular measurement		1
	3. Plane surface measurement		1
29)	<p style="text-align: center;"><u>Speedometer</u></p> <ul style="list-style-type: none"> • It's an important dashboard instrument in a automobile vehicle. • The speedometer tells the driver the speed of a vehicle. • Whether he is driving fast or slow or within specified speed limit. 	<p style="text-align: center;"><u>Tachometer</u></p> <ul style="list-style-type: none"> • It's an important dashboard instrument in a automobile vehicle. • Tachometer tells how fast engine is turning in revolutions per minute (rpm). • It helps to driver should avoid over speed of the vehicle. 	1 1 1

30)	<ul style="list-style-type: none"> • Excessive fuel consumption • No pickup • Engine do not take load • Hard starting • Valve sticks • Engine overheats 	<p>1 1 1</p>
31)	<p>Common faults in cooling system</p> <ul style="list-style-type: none"> • Loose or broken water pump pulley belt • Low level of coolant • Faulty thermostat • Faulty water pump • Dirty or bend radiator fins • Broken water pump fan • Coolant leakage on cooling system • Defective cooling fan motor • Plugged radiator • Faulty radiator cap • Improper ignition timing 	<p>$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$</p> <p>(Any six)</p>
32)	<p>Inspection of Clutch plate for oil leakage</p> <ol style="list-style-type: none"> 1. Check for the oil leakage on the clutch plate. 2. Check the thickness of clutch plate with vernier depth gauge, if it is out of permissible limit the replace it. 3. Check the cover assembly of clutch, if there is oil leakage then replaces the oil seal on gear box or from crankshaft. 4. Place the clutch plate on clutch shaft/input shaft. 5. Place the dial gauge on clutch plate and rotate the clutch shaft for checking the distortion of the clutch plate. 	<p>1 1 1</p> <p>(Any 3)</p>

33)	<ul style="list-style-type: none"> • Transmission system in a vehicle helps to transmit mechanical power from the engine to the wheels. • It is an inter connected system which consist of clutch, gear box, propeller shaft/ drive shafts. • The complete set up of the system helps to maintain the cruising speed of the vehicle without any disturbance 	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>
34)	<ol style="list-style-type: none"> 1. Diaphragm clutch: In this type of clutch, diaphragm spring is used in place of coil spring. This type of clutch is called as diaphragm clutch. 2. Diaphragm clutch is small in size as compare to spring clutch and it transmits more torque as diaphragm exerts more pressure as compare to springs. 3. It is less affected by centrifugal force and it can withstand higher rotational speeds. 4. Diaphragm acts as both clamping spring and release levers. 5. This clutch requires less maintenance compare to other types of clutch. 	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">(Any 3)</p>
35)	<p>Maintenance Tips for Suspension system</p> <ul style="list-style-type: none"> • Thoroughly clean the leaf spring set and its fittings, • Lubricate each leaf with graphite grease, • Tighten the u clamp bolts /nuts with specified torque, • Check the centre bolt, • Tighten the clamp nut bolt with specified torque, • Check the slackness of shackle and tighten the set 	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">(Any 3)</p>

36)	<p>Automobile cables can be classified into three main categories :</p> <p>a. Starting system cables-When the cranking motor is switched on, it draws heavy current in the beginning of its operation</p> <p>b. General purpose cables-There are twelve different sizes of cables which are generally used for automobiles as the standard sizes.</p> <p>c. High-tension cables-The cables connecting the ignition coil to the central point of the distributor and from the distributor to the various spark plugs fall under the category of HT cables.</p> <p style="text-align: center;">Or</p> <p>a. Brown Cables -Brown cables are used for the battery circuit.</p> <p>b. Yellow Cables -These are used for the generator circuit.</p> <p>c. White Cables -These cables are used for the ignition circuits and also for other circuits.</p> <p>d. Green Cables - These cables are used for all the auxiliary circuits.</p> <p>e. Blue Cables-These cables are used for the headlamp circuits.</p>	<p style="text-align: center;">1</p> <p style="text-align: center;">1</p> <p style="text-align: center;">1</p>
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37)	Inspection of battery, <ul style="list-style-type: none"> • A cleaning solution of baking soda and water, or ammonia. • Stiff bristled cleaning brushes. • Terminal pliers and wrenches and perhaps a terminal spreader and puller. • Terminal and connector scraping and cleaning tools. • A battery carrier or lifting strap. • Protective coating for the battery terminals. 	<p style="text-align: center;">1 1 1 (Any3)</p>
<u>PART-D</u>		
D	ANSWER THE FOLLOWING (ANSWER ANY 2)	2x6=12
38)	<div style="text-align: center;">  </div> <p style="text-align: center;">Diagram-5mark ,Parts-1 mark</p>	6

39)	<p>Advantage of M. P. F. I.</p> <ul style="list-style-type: none"> • More uniform Air-Fuel ratio will be supplied to each cylinder, • Vibration from the engine equipped with this system is less, • No need to crank the engine twice or thrice in case of cold starting. • Immediate response, in case of sudden acceleration / deceleration. • Since the engine is controlled by ECM* (Engine Control Module), more accurate amount of A/F mixture will be supplied and as a result complete combustion will take place. • The mileage of the vehicle will be improved. • MPFI-Multi pint fuel ignition system. 	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
40)	<ol style="list-style-type: none"> a. Remove nut bolts from the companion flange of the propeller shaft from the gear box end as well as from the differential. b. Place the propeller shaft on the lathe machine and turn the propeller shaft. c. Place the dial gauge at one end of the propeller shaft. d. If the dial gauge shows deflection of 2 mm then it indicates the propeller shaft is bent. The bent propeller shaft always run noisy. e. To clean and replace the universal joint. f. Clean and check universal joint, if it worn out. g. Remove the snap rings / lock from yoke. Now place the universal joint on arbour press and give gentle pressure h. The bearing cup of cross will come out from 	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>

	<p>opposite end.</p> <p>i. Likewise separate the cross from the yoke.</p> <p>j. Inspect the condition of the following</p> <p>i. Bearing ii. Cross iii. Dust covers iv. Yoke</p>	(Any 6)
41)	<p>Inspection of steering linkages Following procedure should be adopted for inspection of steering linkages</p> <ul style="list-style-type: none"> • Lift the front portion of the car/vehicle, • Turn the steering wheel from one lock end to another lock end, • Check for noise and binding in-steer. • If the binding is traced, remove the drag link connection from steering gearbox. • Now rotate the steering wheel in both the direction and trace for the binding. If the binding is noticed then it probably lies in the steering gear box. • If the binding is not traced in steering gear box then problem is in steering linkage. • Check the ball joint/bushes for free movement with thumb pressure and replace the same if necessary. • • Inspect the ball joint if it is worn out or bellow torned then replace it. 	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>

<p>42)</p>	<ul style="list-style-type: none"> • Battery acid is very corrosive. Do not allow it to come in contact with skin, eyes, or clothing. • When making connections to a battery, be careful to observe polarity, • When disconnecting battery cables, always disconnect the negative (ground) cable first. • When connecting battery cables, always connect the negative cable last. • Avoid any arcing or open flames near battery. • Follow manufacturer’s instructions when charging s battery. • Do not add additional electrolyte to the battery if it is low. Add only distilled water. • Do not wear any jewelry or watches while servicing the battery. • Never lay tools across the battery. 	<p>1 1 1 1 1 1 1 1 1 1 (Any six)</p>
<p>43)</p>	<p style="text-align: center;">QUICK CHECK CHART OF IGNITION PRIMARY CIRCUIT</p> <pre> graph TD A[Inspect all ignition primary wiring for broken, frayed, split, or cut wires. Also check for loose, corroded, or disconnected connectors.] -- NO --> B[Repair or replace components as necessary] A -- OK --> C[Check battery voltage. Should be at least 11.5 volts] C -- NO --> D[Replace or recharge battery.] C -- OK --> E[Check for battery voltage at positive terminal of coil] E -- NO --> F[Check resistance of ballast resistor (if used) for correct value] E -- OK --> G[Check air gap of pick-up coil in distributor.] F -- NO --> H[Replace ballast resistor if value is not to specification] F -- OK --> I[Check wires from battery / Ignition switch to coil. Also check coil primary and secondary resistance.] G -- NO --> J[Check pick-up coil resistance for correct value.] G -- OK --> I J -- NO --> K[Replace pick-up coil if not to specification.] J -- OK --> I I --> L[Adjust or place as necessary] L --> M[Check control module for good ground connections.] M -- OK --> N[If vehicle still fails to run, refer to appropriate service manual for complete primary ignition checks with] </pre>	<p>6</p>

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