CBSE – DEPARTMENT OF SKILL EDUCATION

AUTOMOTIVE (SUBJECT CODE -804)

MARKING SCHEME OF Sample Question Paper

Class XII (Session 2019–2020)

Time: 3 Hours   **Max. Marks: 60**

General Instructions:

1. *This Question Paper consists of two parts viz. Part A: Employability Skills and Part B: Subject Skills.*
2. *Part A: Employability Skills (10 Marks)*
    i. *Answer any 4 questions out of the given 6 questions of 1 mark each.*
    ii. *Answer any 3 questions out of the given 5 questions of 2 marks each.*
3. *Part B: Subject Skills (40 Marks):*
    i. *Answer any 10 questions out of the given 12 questions of 1 mark each.*
    ii. *Answer any 5 questions from the given 7 questions of 2 marks each.*
    iii. *Answer any 5 questions from the given 7 questions of 3 marks each.*
    iv. *Answer any 3 questions from the given 5 questions of 5 marks each.*
4. ***This question paper contains 42 questions out of which 30 questions are to be answered.***
5. *All questions of a particular part/section must be attempted in the correct order.*
6. *The maximum time allowed is 3 hrs.*

PART A: EMPLOYABILITY SKILLS (10 MARKS)

Answer any 4 questions out of the given 6 questions of 1 mark each:

1.	passive	**(1)**
2.	Self-management skills definition refers to our abilities to control our feelings, emotions, and activities. They play a decisive role in our personal and business life	**(1)**
3.	B	**(1)**
4.	C	**(1)**
5.	A	**(1)**
6.	A	**(1)**

Answer any 3 questions out of the given 5 questions of 2 marks each:

7.	**Hearing** is simply the act of perceiving the sound by ear. **Listening** however is something you consciously choose to do. Listening requires concentration so that your brain processes meaning from words and sentences	**(2)**

Hearing	Listening
• Accidental	• Focused
• Involuntary	• Voluntary
• Effortless	• Intentional

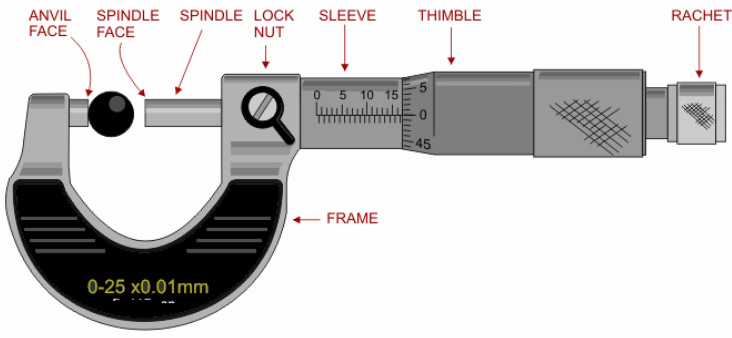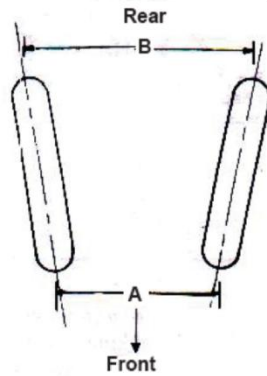| 8.	Communication is the act of conveying meanings from one entity or group to another through the use of mutually understood signs, symbols, and semiotic rules.	**(2)**
9.	Good **self-motivation tips** and techniques are: • to find and list your motives (needs and desires); • find different sources of motivation and inspiration (music, books, activities); • think expansive thoughts; • live fully in the present moment; • dear to have big dreams; • dream often – every day; • remember that nothing is impossible.	**(2)**
10.	The various benefits include the following: • Do what you are interested in: Entrepreneurship allows you to start and do something you like using your hobbies and skills. • Work for yourself, and not for others: As an entrepreneur, you can work for yourself and not for someone else. You can decide the kind of work you like to do and how you want to do it. • Make profits for yourself: As an entrepreneur, you can decide how much money you want to earn and how you want to earn it. • More risk, more profit: Even though there are risks in entrepreneurship, it allows you to decide how much risk you want to take. Usually, the larger the risk, the bigger could be the profit!	**(2)**
11.	The skills used for promoting green economy are known as green skills. These skills are needed in areas similar to renewable energy, sewer water treatment, climate resilient cities, green construction, solid waste management,etc Some of the areas in which green skills contribute to the sustainable development are as follows: • using renewable energy (example, using solar power and wind energy) • water and waste management • rain water harvesting • conserving energy • reducing pollution	**(2)**

PART B: SUBJECT SKILLS (50 MARKS)

Answer any 10 questions out of the given 12 questions:

12.	Engine control Module	**(1)**
13.	A	**(1)**
14.	Slip Joint	**(1)**

15.	C	(1)
16.	D	(1)
17.	C	(1)
18.	B	(1)
19.	A	(1)
20.	C	(1)
21.	C	(1)
22.	Toe-out	(1)
23.	D	(1)

Answer any 5 questions out of the given 7 questions of 2 marks each:

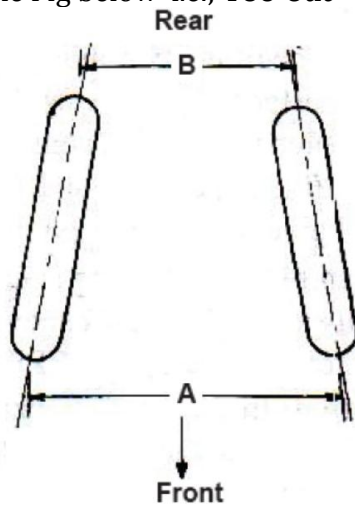| 24.	The power steering system is the system employed in automobiles to reduce the effort required to operate the steering wheel. This feature adds to the comfort while driving, as less effort is required to turn the steering by the driver There are two types of power steering system • Hydraulic Power Steering • Electronic Power Steering	(1) (1)

25.	The functions of propeller shafts are:
	      • To transmit torque
	      • To allow different drive shaft angles
	      • To allow changes in length
	      • To reduce rotary vibrations
		(1/2)
		(1/2)
		(1/2)
		(1/2)

26.	a)A person should have completed 16 years to obtain license for 2 wheelers without gear. b)A person should have completed 18 years age to obtain license for 2 wheelers with gear,	(1) (1)
27.	a)Shock absorbers improve riding comfort. b)It keeps the tyres evenly connected with the road and maintaining a vertical load on the tyres. c)It Reduces the effect of shock forces to the vehicle	(2)
28.	The cut-out relay is a safety device for battery. When the generator speed is very low, due to which the output is not sufficient to balance the battery voltage, the necessity to cut out the generator from the battery arises, because otherwise the battery would discharge into the generator. When the engine and hence the generator speed has reached a sufficiently higher value to match its output to the battery voltage the generator should be automatically connected to the battery	(2)

29.	Hydrometer is used to measure specific gravity of the electrolyte of the battery. It consists of a glass tubular body with a rubber bulb at the top and a sampler tube at the bottom. There is a glass float inside the glass body. There is a mark inside the glass (red & green). This glass float has a vertical density scale. To test the specific gravity of the electrolyte	**(2)**
30.	The **sprung weight** refers to the weight which is supported by the suspension springs. The weight of the vehicle's body, frame, engine, transmission, interior, fuel, and passengers constitute the sprung weight.	**(2)**

Answer any 5 questions out of the given 7 questions of 3 marks each:

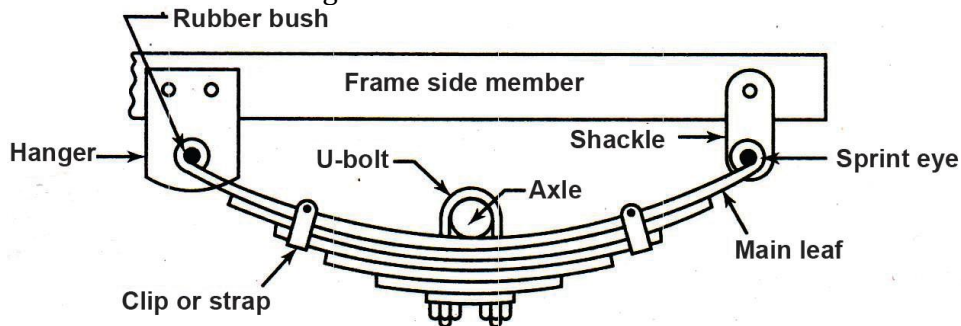| 31.	1. Keep the vehicle on level ground 2. Jack up the vehicle at the certain height to make the wheel free to rotate 3. Loosen the wheel nut and remove out the front wheel 4. Extract brake drum with bearing from stub axle by using puller 5. Remove the brakes pins/ bolts from strut bracket 6. Remove the strut bracket bolts 7. Remove support nuts by supporting the strut properly 8. Dismount the strut assembly from the vehicle 9. Use a spring compressor to remove the strut spring 10. Fix the spring compressor on the strut and compress the spring 11. To remove the spring support unit, loosen the nut slowly and release the spring compressor. 12. Remove the spring from the strut	**(3)**
32.	Micrometer is a measuring instrument used to measure very fine and precise dimensions of length, width, thickness, diameter etc. Micrometer measure the cylindrical component like shaft, bolt, coin, boll etc. This is more accurate and precise than a vernier calliper. Least Count = Pitch / Number of divisions on circular scale (thimble)	**(1)** **(2)**
33.	**Toe Angles (Toe-in and Toe-out):** Toe-in is the amount by which the front wheels are set closer together at the front than at the rear when the vehicle is stationery. Toe-in is shown in the Fig. below i.e.; **Toe-in = B – A.**	$(1\frac{1}{2})$

On the other hand, the wheels may be set closer at the rear than at the front, then it is called
toe-out. Toe-out is shown in the Fig below i.e.; **Toe-out = A – B.**

$(1\frac{1}{2})$

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34. **Leaf Spring:** Leaf springs are made of a number of curved bands of spring steel called "leaves", stacked together in order from shortest to longest. Stack of leaves is fastened together at the centre with a centre bolt or a rivet. To keep the leaves from slipping out of place, they are held at several places with clips. Both ends of the longest (main) leaf are bent to form spring eyes, used to attack the spring to the frame or structural member of a body.

Generally, the longer a leaf spring, the softer it will be. Also, the more leaves in a leaf spring, the greater the load they will withstand. But on the other hand, the spring will become firmer and riding comfort will suffer.

$(1\frac{1}{2})$

$(1\frac{1}{2})$

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35. • For same output, the alternator is much smaller in size as compared to dynamo.
• For same current output the alternator is lighter weight.
• Alternator can produce more current output at low, engine speeds, even at idling. But dynamo can't do that.
• Alternator requires lesser maintenance
• It is more reliable

(3)

	• No cut-out unit is required in alternator. • Maximum driving speed of alternator is comparatively higher (20000 rpm) than dynamo (9000 rpm). • Alternator requires smaller size of driving pulley as compared to dynamo.		
36.	a) At night 1) Aim your headlights correctly, and make sure they're clean 2) Dim your dashboard 3) Clean the windshield to eliminate streaks 4) Slow down to compensate for limited visibility and reduced stopping time 5) Minimize distractions, like talking with passengers or listening to the radio,etc b) In slippery Condition 1) Slow down the vehicle as it takes longer to stop or adjust in wet weather. 2) Stay toward the middle lanes - water tends to pool in the outside lanes 3) Be more alert when driving in wet or slippery conditions. Watch out for brake lights in front of you. 4) Avoid using your brakes; if possible, take your foot off the accelerator to slow down	$(1\frac{1}{2})$ $(1\frac{1}{2})$	
37.	The following are the functions of the rear axles: • They support the weight of the vehicle. • They drive the rear wheels via the final drive. • They rotate the power flow at the final drive by 90^0 on either side for driving the wheels. •The rear axle casing offers space for filling the lubricant for the final drive components. •The rear axle casing serves as protective guard for the complete mechanism of final drive and differential.		

Answer any 3 questions out of the given 5 questions of 5 marks each:

	Problem	Probable cause	Action or Items to be checked	(3+2)
38.	1. Hard Steering	i. Low tyre pressure Inflate the tyre to correct pressure. ii. Too tight steering gear Adjust the tightness. iii.Incorrect wheel alignment Correct the wheel alignment. (specially incorrect steering axis inclination and too much caster) iv.Broken or bent steering Replace the bent or broken parts arms, or knuckles, or suspension arm. v. Insufficient lubricant. Apply sufficient amount of lubricant in	• Inflate the tyre to correct pressure. • Adjust the tightness. • Correct the wheel alignment. • Replace the bent or broken parts • Apply sufficient amount of lubricant.	

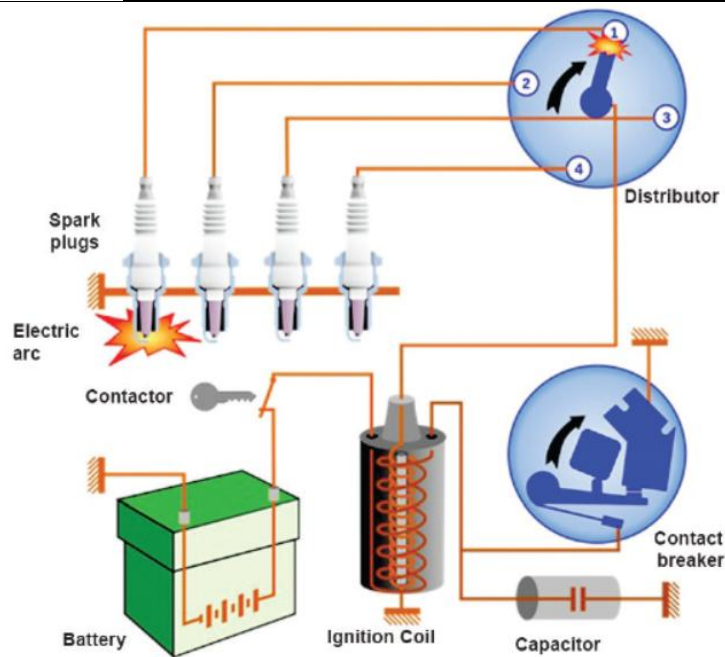|		
39.	It is used as a measuring device to measure the accuracies in alignment, eccentricity of the parts/components. A dial gauge is like a fine watch. It consists of a graduated dial, pointer, plunger and a clamp. It measures the displacement of its plunger on a circular dial by means of a rotating point. It works on the rack and pinion principal. The plunger has gear teeth cut on it and when it reciprocates it actuates a pinion attached to the pointer shaft. Thus any movement of the plunger causes a corresponding movement of the main pointer on a graduated dial.	**(3+2)**
40.	a) **NO ENTRY**	$(2\frac{1}{2})$
	b) **OVER TAKING PROHIBITED**	$(2\frac{1}{2})$
	c) **NO ENTRY** d)	

e)

41.

When the ignition switch is 'ON' the current flows from the battery through the primary winding and produces a magnetic field in the coil. When the contact points open the magnetic field 12 volts from the battery to high tension voltage of about 20 to 30 thousand volts required to jump the spark at the spark plug gap (15000 volts are needed to jump 1mm gap). The distributor then directs this high voltage to the proper spark plug when it jumps the gap, producing a spark which ignites the combustible mixture in the cylinder.

(2+3)

42.	The general constructional detail of the final drive and differential assembly is shown in fig below The ring gear (crown wheel) of the final drive is attached to a differential case which contains four bevel type gear pinions all facing inwards, meshing with each other in the form of a box. Two of the bevel pinions opposite each other are splined to the half shafts and are referred to as the sun gears. The other opposed pair of pinions are free to rotate upon a pinion shaft and are known as pinion shaft which acts as a pivot for the pinion gears in mounted in the differential housing which is driven by the ring gear. There is no direct connection between the ring gear and the half shafts. The final drive gears must function precisely in correct relationship with each other. At the same time they will be transmitting very high torque. For this reason, the final drive and differential assembly is located in the axle casing and supported on taper roller bearings.	**(2+3)**