CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

Technical and Vocational Education Examination

7218 Electrical/Electronics Applied Mechanics 1

JUNE XXXX **ADVANCED LEVEL**

Specialty(Specialty Code)	ELECTRICAL POWER SYSTEM-EPS (F3) & ELECTRONICS-ELN (F2)
Centre No.	
Centre Name	
Candidate No.	
Candidate Name	

Mobile phones are **NOT** allowed in the examination room

7218 Electrical/Electronics Applied Mechanics 1: MULTIPLE CHOICE QUESTION PAPER

One and a half hours

INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you start answering the questions in this paper. Make sure you have a soft HB pencil and an eraser for this examination.

1. USE A SOFT HB PENCIL THROUGHOUT THE EXAMINATION.
2. DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO.

Before the examination begins:

3. Check that this question booklet is headed **Advanced Level – 7218 Electrical/Electronics Applied Mechanics 1**
4. Insert the information required in the spaces above.
5. Insert the information required in the spaces provided on the answer sheet using your HB pencil: **Candidate Name, Exam Session, Subject Code, Centre Number and Candidate Number.** Take care that you do not crease or fold the answer sheet or make any marks on it other than those asked for in these instructions.
6. **Answer ALL questions**
7. Each question has FOUR suggested answers: **A, B, C** and **D**. Decide on which answer is correct. Find the number of the question on the Answer Sheet and draw a horizontal line across the letter to join the square brackets for the answer you have chosen.
   For example, if **C** is your correct answer, mark **C** as shown below:

   [A] [B] [C] [D]

8. Mark only one answer for each question. If you mark more than one answer, you will score a zero for that question. If you change your mind about an answer, erase the first mark carefully, then mark your new answer.
9. Avoid spending too much time on any one question. If you find a question difficult, move on to the next question. You can come back to this question later.
10. Do all rough work in this booklet, using, where necessary, the blank spaces in the question booklet.
11. Texts, notes and pre-prepared materials of any kind are also **NOT** allowed in the examination room.
12. **At the end of the examination, the invigilator shall collect the answer sheet first and then the question booklet after. DO NOT ATTEMPT TO LEAVE THE EXAMINATION HALL WITH IT**.

1. A vector is characterized by:

A An application point, a line of action and a sense
B An application point, a line of action and a magnitude
C An application point, a line of action , a sense and a magnitude
D An application point and a magnitude

Considering a vector $\overrightarrow{QP}$ = i + 2j +2k, answer questions 2 and 3.

2. The magnitude of vector $\overrightarrow{QP}$ is:

A 9
B 3
C $\sqrt{3}$
D 5

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3. The vector $\overrightarrow{PQ}$ will be equal to:

A i + 2j -2k
B i -2j -2k
C -i + 2j +2k
D -i - 2j -2k

---

4. Power can be defined as

A Work /time
B Work/energy
C Work x time
D Work/distance

---

5. The linear velocity of a point on the rim of a wheel of 10m diameter, is 50m/s, its angular velocity will be

A 10 rad/s
B 20 rad/s
C 15 rad/s
D 5 rad/s

---

6. A number of forces acting simultaneously on a particle of a body

A may not be replaced by a single force
B may be replaced by a single force
C may be replaced by a couple
D may be replaced by a single force through C.G. of the body

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7. Pick up the incorrect statement from the following:

A The C.G. of a circle is at its centre
B The C.G. of a triangle is at the intersection of its medians
C The C.G. of a semicircle is at the distance of r/2 from the centre
D The C.G. of a rectangle is at the intersection of its diagonals

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8. The angular velocity ω (rad/s) of a body rotating at N revolution per minute is

A $\omega = 2\pi N$
B $\omega = \pi N/180$
C $\omega = 2\pi N/60$
D $\omega = 2\pi N/180$

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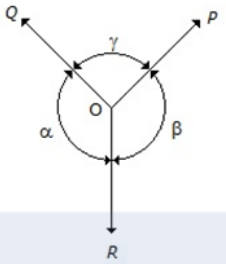
9. The bellow figure shows the three coplanar forces P, Q and R acting at a point O.



If these forces are in equilibrium, then

A $P/\sin\beta = Q/\sin\alpha = R/\sin\gamma$
B $P/\sin\alpha = Q/\sin\beta = R/\sin\gamma$
C $P/\sin\gamma = Q/\sin\alpha = R/\sin\beta$
D $P/\sin\alpha = Q/\sin\gamma = R/\sin\beta$

Considering the following equation of a rectilinear motion $X = 4t^2 + 5t$, answer questions 10 and 11.

10. The velocity is

A V = 4t
B V = 4t + 5
C V = 5
D V = 4 +5t

---

11. The acceleration is

A a = 4
B a = 4t
C a = 5
D a = 5t

---

12. The unit of the a linear velocity is

A rev/s
B m/s
C rad/s
D N/s

---

13. The equiprojctivity method is used in

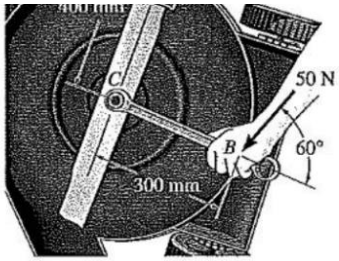
A Statics
B Kinematics
C Dynamics
D Kinetics

---

14. Work is defined as

A Mass x velocity
B Mass x acceleration
C Force x perpendicular distance from the axis
D Force x displacement

15. A force of 50N is applied on a spanner as shown on the figure below.



The magnitude of the moment of that force at point C is given by the formula

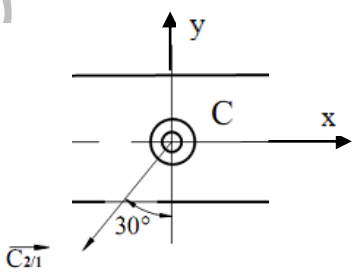
A $300Sin60^0 \times 50$
B $300cos60^0 \times 50$
C $300tan60^0 \times 50$
D 300×50

16. What is the branch of applied mechanics which refers to the study of stationary rigid body?
A Statics
B Kinematics
C Dynamics
D Strength of materials

17. Joule is the unit of
A Force
B Work
C Power
D velocity

18. Forces are called coplanar when all of them acting on body lie in
A One point
B One plane
C Different planes
D Perpendicular planes

19. A force $\overrightarrow{C_{2/1}}$ applied at point C is represented below.



The components of this force are:

A $Cx = Csin\theta$; $Cy = Ccos\theta$;
B $Cx = -Csin\theta$; $Cy = -Ccos\theta$;
C $Cx = -Csin\theta$; $Cy = Ccos\theta$;
D $Cx = Csin\theta$; $Cy = -Ccos\theta$;

20. The relation between the power and work is defined as

A $P = W/t$
B $P = Wt$
C $P = 0.5Wt$
D $P = t/W$

21. The moment of inertia of a thin rod of mass 'm' and length 'l', about an axis through it center of gravity and perpendicular to its length is

A $Ml^2/4$
B $Ml^2/6$
C $Ml^2/8$
D $Ml^2/12$

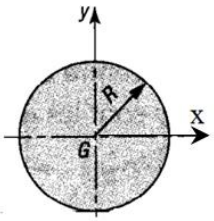
22. The resultant of two forces P and Q (such that P>Q) acting along the same straight line, but in opposite direction, is given by

A P + Q
B P - Q
C P/Q
D Q/P

23. When a body of mass 'm' attains a velocity 'v' from rest during a time't', then the kinetic energy of translation is

A mv^2
B mgv^2
C $0.5mv^2$
D $0.5mgv^2$

24. The figure below represents a circular section.



The second moment of area of that section about an axis perpendicular to the section is _than that about x-x axis.

A Two times
B same

C half
D Quarter

25. The resultant of two forces P and Q acting at an angle θ is

A $\sqrt{P^2 + Q^2 + 2PQsin\theta}$
B $\sqrt{P^2 + Q^2 + 2PQcos\theta}$
C $\sqrt{P^2 + Q^2 - 2PQcos\theta}$
D $\sqrt{P^2 + Q^2 + 2PQtan\theta}$

26. The unit of angular acceleration is__
A Nm
B m/s
C m/s^2
D rad/s^2

27. The moment of inertia of a square of side (a) about an axis through its center of gravity is__
A $a^4/4$
B $a^4/8$
C $a^4/12$
D $a^4/36$

28. The motion of a particle round a fixed axis is__
A Translator
B Rotary
C Circular
D Translator as well as rotary

29. What refers to the forces that hold part of the rigid body together?

A Concentrated forces
B Internal forces
C External forces
D Natural forces

30. When a body slides down an inclined plane without friction, the acceleration of the body is
A g
B gsinα
C gcosα
D gtanα

31. During a uniformly varied circular motion, the equation of the motion is:__

A $\theta = \omega t + \theta_0$
B $x = vt + x_0$
C $\theta = 0.5\,(d\omega/dt)\,t^2 + \omega_0 t + \theta_0$
D $x = 0.5(dv/dt)\,t^2 + v_0 t + \theta_0$

32. In a perfect machine, the efficiency is:

A $\eta = 0.5$
B $\eta = 1$
C $\eta > 1$
D $\eta < 1$

33. For three coplanar forces which act on a rigid body to keep it in equilibrium, the forces must be

A Concurrent
B Parallel
C Concurrent or parallel
D Perpendicular

34. 'P' is the force acting on a body whose mass is 'm' and acceleration is 'a'.
The equation P - ma= 0, is known as

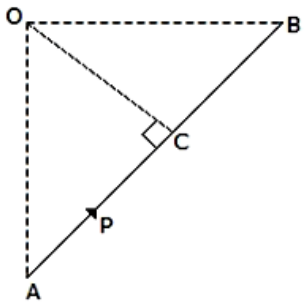
A Equation of dynamics
B Equation of dynamics equilibrium
C Equation of statics
D Equation of kinetics

35. The truck on the figure below moves with a rectilinear motion.

The kinetic energy of the truck is given by the formula:

A $K_E = mv^2$
B $K_E = 0.5mv^2$
C $K_E = m/v^2$
D $K_E = mv$

36. A force P acting at point A is represented on the figure below.



The moment of the force 'P' about 'O' in the below figure is:

A P x OA
B P x OB

C P x OC
D P x AC

37. The intensity of the force is also called:

A Mass
B Force
C Direction
D Magnitude

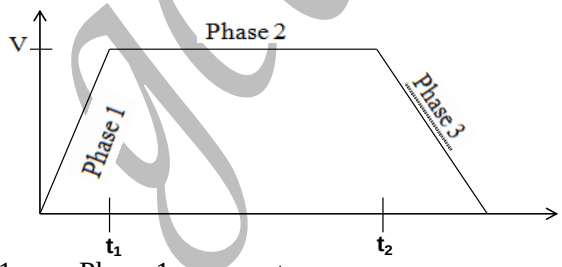
38. A vehicle moving at high speed faced an obstacle and the driver braked until stop During that action the motion of the vehicle is called:

A Uniform rectilinear motion
B Uniformly accelerated rectilinear motion
C Uniformly decelerated rectilinear motion
D Uniform circular motion

39. Which of the following is a scalar?
A Force
B Electric current
C Weight
D Torque

40. If the normal force is doubled, the coefficient of friction is:
A Double
B Not changed
C Halved
D Triple

The graph shown below represents the three phases of an automobile vehicle moving on the road. Answer questions 41 and 42.



41. Phase 1 represents:
A Uniform motion
B Uniform accelerated motion
C Uniform decelerated motion
D Rest

42. Phase 2 represents:
A Uniform motion
B Uniform accelerated motion
C Uniform decelerated motion
D Rest

43. When a constant force is applied on a given mass, it move with uniform
A Velocity
B Energy
C Acceleration
D Momentum

44. When two forces, each equal to P, act at 90° to each other, then the resultant will be:
A 0
B $\sqrt{2}P$
C 2P
D 4P

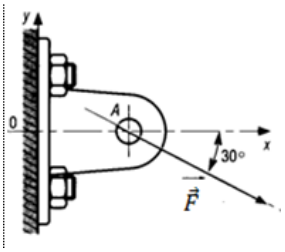
45. With of the following is a scalar quantity
A Torque
B Work
C Force
D Displacement

46. Displacement, velocity and acceleration of a particle are:
A All vector quantities
B All vector quantities except displacement
C All vector quantities except velocity
D All vector quantities except acceleration

47. The kinetic energy due to rotation is equal to:
A $I\omega^2$
B $I\omega^2/2$
C $I\omega/2$
D $I\omega^2/4$

45 A type of force acting on a body due to the acceleration of gravity is
A Load
B Shear
C Bear
D mass

49. A force $\vec{F}$ is represented as shown in the figure below.



The y-component of the force $\vec{F}$ is:

A $F\cos 30^0$
B $F\sin 30^0$
C $-F\cos 30^0$
D $-F\sin 30^0$

50. The unit of the moment of inertia is:
A Kg. m
B Kg/m^2
C $Kg .m^2$
D $Kg .m^4$

NOW GO BACK AND CHECK YOUR WORK