يتكون هذا الاختبار من (100) سؤال موضوعي من نوع الاختيار من متعدد، الإجابة عنها إجبارية. ظلل بقلم الرصاص بشكل غامق الدائرة التي تشير إلى الإجابة الصحيحة في المكان المخصص لذلك في نموذج الإجابة المرفق.

الفيزياء

***Acceleration due to gravity g = 10 m/s^2**
***Coulomb's Constant $k_e = 9\times10^9$ N.m^2/C^2**
***Electron charge e = 1.6×10^{-19} C**

1. For the two vectors $\vec{A} = (-\hat{i} + 3\hat{j})$ and $\vec{B} = (2\hat{i} + \hat{j})$. The vector $2\vec{A} + \vec{B}$ equals

a- $-4\hat{i} + 4\hat{j}$ b- $-4\hat{i} + 7\hat{j}$
c- $7\hat{j}$ d- $-4\hat{i}$

2. Find the dot product of the vectors $\vec{A}$ and $\vec{B}$: $\vec{A} = 2\hat{i} + 5\hat{j} - 4\hat{k}$ and $\vec{B} = -2\hat{i} - 3\hat{j} - 5\hat{k}$:

a- 1 b- $-4\hat{i} - 15\hat{j} + 20\hat{k}$
c- 11 d- $2\hat{j} - 9\hat{k}$

3. A car accelerates so that it goes from a velocity of 20 m/s to a velocity of 40 m/s in 4 seconds. What is its acceleration?

a- 0.2 m/s^2 b- 5 m/s^2
c- 4 m/s^2 d- 10 m/s^2

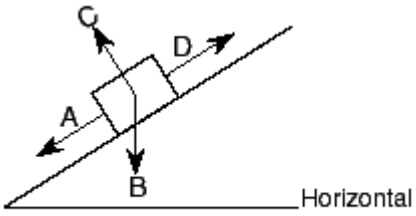
4. As an object falls freely in a vacuum, its

a- velocity increases b- acceleration increases
c- acceleration decreases d- both a and b

5. A horizontal force of 20 N is applied on an object of mass 10 kg. What is its acceleration?

a- 2 m/s^2 b- 200 m/s^2
c- 0.5 m/s^2 d- 20 m/s^2

6. In the diagram below, a box is at rest on an inclined plane. Which vector represents the direction of the normal force acting on the box?



a- A b- B
c- C d- D

7. A 50 kg object rests on the floor. The coefficient of static friction is 0.5. The force parallel to the floor needed to move the object is most nearly:

a- 250 N b- 500 N
c- 125 N d- 1000 N

8. A particle is accelerated in uniform circular motion at a rate of 2 m/s^2, around a circle of radius of 18 m. What is the particle's speed, in m/s?

a- 36 b- 9
c- 6 d- 3

9. A car is moving at 20 m/s along a straight horizontal track. What will its speed be after climbing the 15-m hill shown in the figure, if friction is ignored?

a- 17 m/s b- 7 m/s
c- 5 m/s d- 10 m/s

10. Energy is measured in the same units as

a- Power b- Force
c- Work d- Momentum

11. What power is needed to lift a 50-kg object a vertical distance of 5.0 m in 20.0 s?

a- 12.5 watt b- 125 watt
c- 25 watt d- 250 watt

12. A ball is moving at 6 m/s and has a momentum of 24 kg.m/s. What is the ball's mass?

a- 0.3 kg b- 4 kg
c- 24 kg d- 144 kg

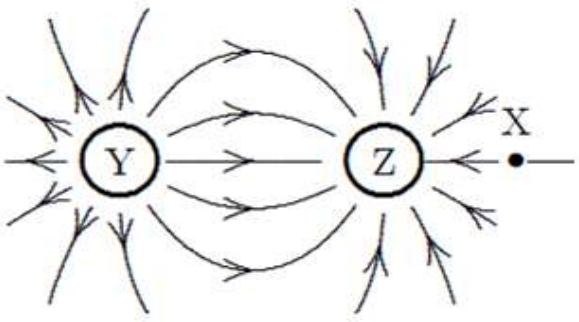
13. A particle of mass 1 kg is located at (0,0) and a particle of mass 2 kg is located at (3,0). What is the location of the center of mass of this system?

a- (0,0) b- (1,0)
c- (1.5,0) d- (2,0)

14. Two identical charges, 2.0 m apart, exert forces of magnitude 4.0 N on each other. The value of either charge is:

a- 1.8×10^{-9} C b- 2.1×10^{-5} C
c- 4.2×10^{-5} C d- 1.9×10^{5} C

15. The diagram shows the electric field lines in a region of space containing two point charges (Y and Z). Then:

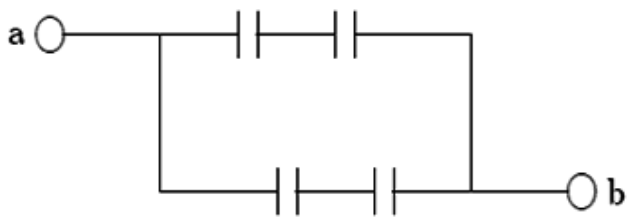


a- Y is negative and Z is positive
b- the magnitude of the electric field is the same everywhere
c- Y is positive and Z is negative
d- Y and Z must have the same sign

16. Two point charges q_1 = 25 nC and q_2 = -75 nC are separated by a distance of 20 cm. What is the electric potential at the midpoint between them?

a- -2.25 kV b- - 4.5 kV
c- -9 kV d- -18 kV

17. The diagram shows four 6-μF capacitors. The equivalent capacitance between points a and b is:

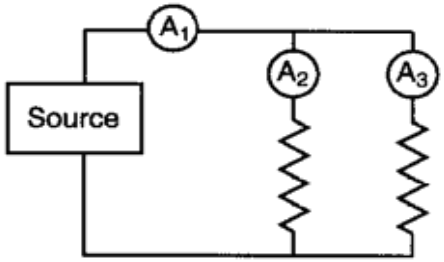


a- 3 μF
b- 4 μF
c- 9 μF
d- 6 μF

18. A charged capacitor stores 10 mC at a potential difference 40V. Its stored energy is:

a- 200 J
b- 400 J
c- 2.5 J
d- 0.2 J

19. Three ammeters are placed in a circuit as shown, if A_1 reads 5.0 amperes and A_2 reads 2.0 amperes, what does A_3 reads?



a- 1.0 A
b- 3.0 A
c- 2.0 A
d- 7.0 A

20. In the diagram, the current in the 3-Ω resistor is 4A. The potential difference between points 1 and 2 is:

a- 12V
b- 0.8V
c- 1.25V
d- 20V

الرياضيات

21. The solution of the inequality $2 \geq 3 - x \geq -1$ is:

a- $[-1, 4]$
b- $[1, 4]$
c- $[-4, 1]$
d- $[-4, -1]$

22. The fourth vertex of the square, three of whose vertices are $(2, -2)$ ، $(-1, -2)$ ، $(2, 1)$ is:

a- $(1, -1)$
b- $(1, 1)$
c- $(-1, -1)$
d- $(-1, 1)$

23. The distance between $A(-1, 6), B(3, -2)$ is:

a- $\sqrt{80}$
b- $\sqrt{48}$
c- $\sqrt{20}$
d- $\sqrt{12}$

24. **The slope of the line whose angle of inclination** 240° **is:**

a- $-\sqrt{3}$ b- $\frac{1}{\sqrt{3}}$

c- $-\frac{1}{\sqrt{3}}$ d- $\sqrt{3}$

25. **The equation of the line passes through** $(2,1),(1,-1)$ **is:**

a- $2y+x-3=0$ b- $y-2x+3=0$

c- $2y-x+3=0$ d- $y+2x-3=0$

26. **The equation of the circle whose center** $(1,-2)$ **and radius** $\sqrt{3}$ **is:**

a- $(y+2)^2+(x+1)^2=\sqrt{3}$ b- $(y+2)^2+(x-1)^2=3$

c- $(y-2)^2+(x+1)^2=3$ d- $(y-2)^2+(x-1)^2=\sqrt{3}$

27. **The coordinates of the vertex of the parabola** $y=3+x^2$ **are:**

a- $(0,3)$ b- $(0,-3)$

c- $(3,0)$ d- $(-3,0)$

28. **The domain of the function** $f(x)=\frac{2}{x^2+1}$ **is:**

a- $(-\infty,1)$ b- $(-1,1)$

c- $(-1,\infty)$ d- $(-\infty,\infty)$

29. **The range of the function** $f(x)=4-\sqrt{x}$ **is:**

a- $[4,\infty)$ b- $(-\infty,4]$

c- $[1,4]$ d- $[-1,4]$

30. **If** $f(x)=x+2$ **and** $g(x)=\sqrt{x-1}$ **then** $(fog)(x)=$

a- $2+\sqrt{x-1}$ b- $\sqrt{x+1}$

c- $1+\sqrt{x+2}$ d- $2-\sqrt{x+1}$

31. $\lim_{x\to 1}\frac{x^2+x-2}{x^2-1}=$

a- 0 b- 1

c- $\frac{3}{2}$ d- ∞

32. $\lim_{x\to\infty}\frac{x+3}{2x-1}=$

a- ∞ b- 2

c- $\frac{1}{2}$ d- $-\infty$

33. **The points of discontinuity of the function** $f(x)=\dfrac{x+2}{x^2-9}$ **are:**

a- -2 b- -3

c- 3 d- ∓ 3

34. **If** $y=(2x+1)(3-x)$**, then** $\dfrac{dy}{dx}$ **=**

a- $5-4x$ b- -2

c- $7+4x$ d- 5

35. **If** $f(x)=\cos^2 x$**, then** $f'(x)$**=**

a- $\cos x \sin^2 x$ b- $-2\cos x \sin x$

c- $2\cos x \sin x$ d- $-\sin x \cos^2 x$

36. **The min. value of** $f(x)=x^2-2x-3$ **on the interval** $[-1,3]$ **is:**

a- 0 b- 3

c- -4 d- 1

37. **The max. value of** $f(x)=1-x^4$ **on the interval** $[-2,1]$ **is:**

a- 2 b- 1

c- -2 d- -1

38. **Evaluation of the integral** $\int\left(2x-\dfrac{1}{x^2}\right)dx$ **is:**

a- $2+\dfrac{1}{x}+c$ b- $-2+\dfrac{1}{x^2}+c$

c- $x^2-\dfrac{1}{x^3}+c$ d- $x^2+\dfrac{1}{x}+c$

39. **Evaluation of the integral** $\int cox \sin^2 x\,dx$ **is:**

a- $\dfrac{1}{3}\sin^3 x+c$ b- $\dfrac{1}{2}\cos^2 x+c$

c- $\dfrac{1}{3}\sin^3 x\cos x+c$ d- $\dfrac{1}{2}\sin x\cos x+c$

40. **The area enclosed between the two curves** $y=-x^2$**,** $y=x-2$ **on the interval** $[-2,1]$ **is:**

a- $\dfrac{5}{2}$ b- $\dfrac{8}{3}$

c- $\dfrac{9}{2}$ d- $\dfrac{5}{3}$

المواد الهندسية

41. **الفولاذ هو احد أنواع حديد:**

ا- الزهر ب- السكب

ج- المطاوع د- الصلب

42. تعتبر سبيكة البرونز من المعادن التالية:

ا- الألمنيوم ب- النحاس

ج- الكروم د- النكيل

43. يتميز الألمنيوم بإحدى الصفات التالية:

ا- خفة الوزن ب- مقاوم للتوصيل الحراري

ج- مقاوم للتوصيل للكهرباء د- قابل للصدىء

44. إن ابسط أنواع جزيئات المونوميرات هو جزيئ الايثيلين وتركيبه الكيميائي كالتالي:

ا- C_1H_3 ب- C_2H_2

ج- C_2H_4 د- C_4H_4

45. تحدد كتلة الذرة بأنها كتله :

ا- البروتونات ب- النيوترونات

ج- (البروتونات + النيوترونات) د- الالكترونات

46. عدد الذرات في المكعب مركزي الوجه (F.C.C) هو :

ا- 2 ذرات ب- 3 ذرات

ج- 4 ذرات د- 5 ذرات

47. عند نقطة اليوتيكتويد في منحنى الحديد والكربون يكون عدد الاطوار عندها:

ا- طور واحد ب- ثلاثة اطوار

ج- طورين اثنين د- أربعة أطوار

48. الرابطة الذرية التي تربط الذرات في مركب CH_4 هي:

ا- تساهمية ب- فلزية

ج- أيونية د- فان ديرفان

49. الستينلس ستيل هو عبارة عن فولاذ مضاف إليه أحد المعادن التالية بنسبة 18%:

ا- التنجستون ب- السيلكون

ج- الخارصين د- الكروم

50. احد العناصر التالية لا يدخل في سبائك الصلب :

ا- الكربون ب- المنغنيز

ج- النيكل د- البرونز

51. مما يعزز مقاومة الصلب للصدأ وجود العنصر التالي به:

ا- الكروم ب- النيكل

ج- الكربون د- الألمنيوم

52. إن وجود السيلكون في الصلب يؤدي إلى:

ا- تقليل حد المرونة ب- زيادة حد المرونة

ج- تقليل مقاومة الشد د- زيادة المتانه

53. **إن وجود النيكل في سبيكة الحديد الصلب يؤدي إلى:**

ا- مقاومة الصلب للكهرباء ب- سهوله الصلب للحام

ج- زيادة مقاومة الصلب للتآكل د- مقاومة الصلب للشد

54. **يعتبر الزئبق من الأنواع:**

ا- مفرطه الموصلية الكهربائية ب- متوسط الموصليه الكهربائية

ج- قليلة الموصلية للكهربائية د- عازلة للموصلية الكهربائية

55. **تعتبر خاصية الليونة هي مقاومة المادة:**

ا- لامتصاص الطاقة ب- للتحميل

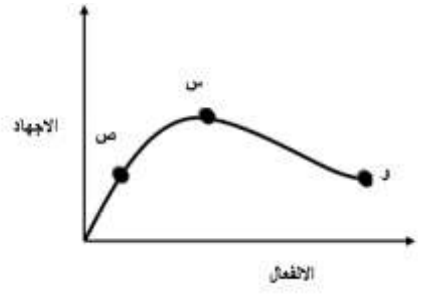
ج- للتشغيل د- أو عدم مقاومة المادة لأي نوع من التشكيل

56. **قدرة المعدن على امتصاص الطاقة وإعادتها ثانيا للأحمال المؤثرة عليها تسمى خاصية:**

ا- الارتداد (الرجوعية) ب- المرونة

ج- الصلابة د- المتانة

57. **في منحنى الإجهاد والانفعال تمثل النقطة و:**



ا- نقطة الخضوع العليا ب- نقطة الخضوع السفلى

ج- نقطة الحد الأعلى للمقاومة د- نقطة الانهيار

58. **يعرف معامل يونغ (معامل المرونة) بأنه:**

ا- الإجهاد / الانفعال ب- الانفعال / الإجهاد

ج- الإجهاد× الانفعال د- الانفعال – الإجهاد

59. **يعتبر التحميل المستمر (بقاء الحمل مؤثراً مده طويلة) تحميل:**

ا- ديناميكي ب- استاتيكي

ج- متكرر د- ديناميكي متكرر

60. **تعرف الصلابة بأنها:**

ا- قابلية المادة للطرق ب- قابلية المادة لتحمل الضغط

ج- مقاومة المادة للكسر د- مقاومة المادة لأي نوع من التغير بالشكل

مهارات الاتصال والكتابة الفنية

61. **Communication skill is the ability and talent to …….. .**

a- send and receive messages successfully with others
b- get personal goals
c- occupy different but overlapping environments
d- assist in learning

62. There are two types of communication skills, these types are …… skills .

a- signal and channel
b- physical and practical
c- verbal and nonverbal
d- social and identity

63. In SPAM model, the audience refers to the ……. to which/to whom the presentation is directed.

a- place
b- situation
c- method
d- people

64. The type of presentation in which the presenter tries to obtain and keep the audience's attention is a/an …….. .

a- informative presentation
b- persuasive presentation
c- entertaining presentation
d- content presentation

65. One of the guidelines for effective delivery of the presentation introduction is to be …… .

a- natural
b- satisfied
c- honest
d- unfamiliar with your topic

66. Semantics is a branch of linguistic science that studies …….. .

a- the way words are assembled
b- the meanings of words
c- how sounds are combined to form words
d- the way in which language is used to interpret real intentions in particular situations

67. ……..…. can help you to give bad news easier; for example, *"That's an interesting outfit."*

a- Euphemistic language
b- Relative language
c- Abstraction language
d- Equivocal language

68. Artifactual communication includes …….. .

a- vocal aspects of language
b- orientation (face to face, one sitting, one standing …etc.)
c- things like kind of clothing people wear, the colors they use
d- space and time

69. Color sends strong messages, Blue color signifies …….. in Cherokee Indian.

a- defeat
b- danger
c- joyous
d- truce

70. One of the important suggestions for controlling speech anxiety is to …….. .

a- feel subordinate to your audience
b- focus on the audience
c- undergo evaluation
d- rely on a second language

71. The gesture of circled thumb and forefinger has different meanings in different cultures. For Americans it means ……. .

a- I WILL KILL YOU
b- ZERO
c- MONEY
d- OK

72. If you want to show respectful for an American man while you are speaking with him, you should ……. .

a- keep eye contact with him
b- continue looking at him with stopping
c- look at him but not too long
d- never look at him

73. The process of handling questions effectively means to have the skill of …… .

a- reading process
b- speaking process
c- listening process
d- writing process

74. *Is your voice too shrill or strained? Do you speak in a monotone? In normal speech, pitch varies.* These variations are known as ……. .

a- inflection
b- volume
c- quality
d- rate

75. In telephone calls we usually use some vocabularies such as; *"log a call"* and it means …….. .

a- stop talking
b- making a call
c- leaving a message
d- closing the telephone call

76. When a receptionist receives a certain call from a certain speaker, he should open his response by ……..…… .

a- naming his name and his family's name
b- asking politely if any help is required
c- naming his company and his name
d- identifying the caller

77. On a telephone call, if you are over stimulated, tend to seek and enter into arguments and judge before comprehension is completed, then you are a/an ……. listener.

a- good
b- successful
c- effective
d- poor

78. The purpose of a Problem Solving Meeting is …….. .

a- to discuss an issue or conflict and make a decision on how to solve it
b- to decide how to deal with the present as well as to prevent future problems
c- to produce new ideas about a specific topic
d- to give and receive information about a specific idea or important matter

79. Each meeting should have a concise written …… that is distributed in advance to all participants.

a- handout
b- agenda
c- postcard
d- minutes

80. The type of conflict that discusses the allocation of resources, salaries, vacation time, and office space is called a/an …….. conflict.

a- subjective b- relationship
c- objective d- social

اساسيات الكهرباء

81. In an electrical circuit if VP=200v then the $V_{r.m.s}$ is equal to :

a- 14.4 v b- 141.4 v
c- 7.07v d- 70.7v

82. The unit of impedance (Z) is:

a- tesla b- HZ
c- ohm d- no unit

83. The commutator is advice used to:

a- convert the D.C voltage to A.C voltage.
b- convert the A.C voltage to D.C voltage.
c- connect the generator to the load.
d- all of the above is correct.

84. Electronic multimeter is:

a- an electrical device used to measure voltage only.
b- an instrument which magnifies small quantities.
c- an electronic measuring instrument that combines several measurement functions in one unit.
d- a combination of mechanical, electrical and electronic measuring device.

85. The unit of the power is:

a- watt b- ampere
c- ohm d- volt

86. Voltmeters are always connected to circuits in:

a- parallel b- compound
c- shunt d- series

87. The secondary power in transformer:

a- equals the primary one
b- less than the secondary power
c- more than the secondary power
d- power primary = power secondary x turns ratio

88. The direction of the current inside the source is from:

a- positive to negative b- negative to positive
c- north to south d- south to north

89. The unit of inductance is:

a- farad b- V.A
c- ohm d- Henry

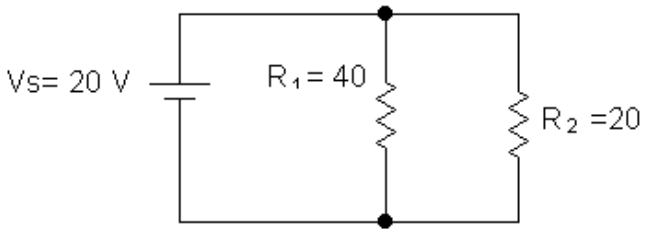
90. The magnet that is created by flow of electrons in a conductor is called:

a- Bar magnet. b- Horse shoe magnet.
c- Permanent magnet. d- Electromagnet.

91. The unit of capacitance is:

a- Walt. b- Volt.
c- Ohm. d- Farad.

92. In the circuit shown find R_T (The Total Resistance):-



a- 0.75 Ω
b- 1.33 Ω
c- 0.075 Ω
d- 13.33 Ω

93. Ref to the previous question No. 92 the current in R_1 equals:

a- 0.5 A
b- 1 A
c- 0.8 A
d- 17.77 A

94. All components in Series Circuit:

a- Have Same Voltage Across Them
b- Have Same Value
c- Carry Same Currents
d- Non Of Above

95. The Time needed to complete One Cycle Is:-

a- Period
b- Frequency
c- Peak Value
d- R.M.S Value

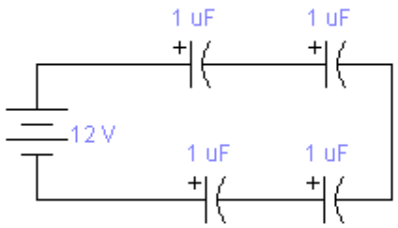
96. The increases of the applied voltage results in ----- of the current through the resistor.

a- increase
b- decrease
c- no change
d- rise then drop

97. When the circuit is opened the current equales:

a- max
b- min
c- Zero
d- the value is doubled

98. The total capacitance for the circuit bellow is



a- 4 µF
b- 1 µF
c- 0.5 µF
d- 0 .25 µF

99. In a series circuit with R = 10Ω, X_L = 25Ω and X_c = 35Ω and carrying an effective current of 5A, the power dissipated is:

a- $250\sqrt{2}$ W
b- 250 W
c- 500 W
d- 50 W

100. The applied voltage on (20 kΩ) resister with (4mA) current is:

a- 5V
b- 80 V
c- 80 mV
d- 80 kV

انتهت الأسئلة