DDS ACADEMY

ELECTRO-MAGNETIC WAVES DPP

MAINS/NEET

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	W/hich	of the tol	LOWING ctat	ement is wro	nn c

- (a) Infrared photon has more energy than the photon of visible light
- (b) Photographic plates are sensitive to ultraviolet rays
- (c) Photographic plates can be made sensitive to infrared rays
- (d) Infrared rays are invisible but can cast shadows like visible light rays
- 2. Pick out the longest wavelength from the following types of radiations
 - (a) Blue light
- (b) *y*-rays
- (c) X-rays
- (d) Red light
- **3.** Wave which cannot travel in vacuum is
 - (a) X-rays
- (b) Infrasonic
- (c) Ultraviolet
- (d) Radio waves
- 4. Light is an electromagnetic wave. Its speed in vacuum is given by the expression
 - (a) $\sqrt{\mu_o \varepsilon_o}$
- (b) $\sqrt{\frac{\mu_o}{\varepsilon_o}}$
- (c) $\sqrt{\frac{\varepsilon_o}{\mu_o}}$
- (d) $\frac{1}{\sqrt{\mu_o \varepsilon_o}}$
- **5.** The range of wavelength of the visible light is
 - (a) 10 Å to 100 Å
- (b) 4,000 Å to 8,000 Å
- (c) 8,000 Å to 10,000 Å
- (d) 10,000 Å to 15,000 Å
- 6. Which radiation in sunlight, causes heating effect
 - (a) Ultraviolet
- (b) Infrared
- (c) Visible light
- (d) All of these
- 7. Which of the following represents an infrared wavelength
 - (a) $10^{-4} cm$
- (b) 10^{-5} cm
- (c) $10^{-6} cm$
- (d) $10^{-7} cm$
- **8.** The wavelength of light visible to eye is of the order of
 - (a) $10^{-2} m$
- (b) $10^{-10} m$
- (c) 1 m
- (d) $6 \times 10^{-7} m$
- 9. The speed of electromagnetic wave in vacuum depends upon the source of radiation
 - (a) Increases as we move from γ -rays to radio waves
 - (b) Decreases as we move from γ -rays to radio waves
 - (c) Is same for all of them
 - (d) None of these
- 10. Which of the following radiations has the least wavelength
 - (a) γ -rays
- (b) β -rays
- (c) α-rays
- (d) X-rays
- 11. The maximum distance up to which TV transmission from a TV tower of height h can be received is proportional to
 - (a) $h^{1/2}$
- (b) *h*

(c) h

- (d) h^2
- 12. Which of the following are not electromagnetic waves

	(a) Cosmic rays	(b) Gamma rays
	(c) β -rays	(d) X-rays
13.	Ozone is found in	
	(a) Stratosphere	(b) Ionosphere
	(c) Mesosphere	(d) Troposphere
14.	The electromagnetic waves	
	(a) Equal to velocity of sou	
	(b) Equal to velocity of light	
	(c) Less than velocity of lig(d) None of these	
15.	The ozone layer absorbs	
15.	(a) Infrared radiations	(b) Ultraviolet radiations
	(c) X-rays	(d) γ -rays
16.	Electromagnetic radiation of	
	Ü	
	(a) Infrared radiations	(b) Visible radiation
	(c) Radio waves	(d) <i>y</i> -rays
17.	Which of the following show	s green house effect
	(a) Ultraviolet rays	(b) Infrared rays
40	(c) X-rays	(d) None of these
18.		s have the maximum wavelength
	(a) X-rays (c) UV rays	(b) I.R. rays (d) Radio waves
19.	and the second s	ansverse in nature is evident by
1).	(a) Polarization	(b) Interference
	(c) Reflection	(d) Diffraction
	\rightarrow \rightarrow	
20	If E and D are the electric	and magnetic field vectors of D.M. ways then the direction of propagation of D.M. ways is
20.		and magnetic field vectors of E.M. waves then the direction of propagation of E.M. wave is
20.	If E and B are the electricalong the direction of	and magnetic field vectors of E.M. waves then the direction of propagation of E.M. wave is
20.	along the direction of →	
20.		and magnetic field vectors of E.M. waves then the direction of propagation of E.M. wave is (b) \vec{B}
20.	along the direction of →	
20.	along the direction of (a) \vec{E}	(b) \vec{B} (d) None of these
	along the direction of (a) \vec{E} (c) $\vec{E} \times \vec{B}$	(b) \vec{B} (d) None of these
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 (a) a < b, b > c (b) a > b, b > c (c) a > b, b < c (d) a < b, b > c (e) a > b, b < c Radio waves and visible light in vacuum have (a) Same velocity but different wavelength (b) Continuous emission spectrum (c) Band absorption spectrum (d) Line emission spectrum Energy stored in electromagnetic oscillations is in the form of (a) Electrical energy (b) Magnetic energy (c) Both (a) and (b) (d) None of these Heat radiations propagate with the speed of (a) α-rays (b) β-rays (c) Light waves (d) Sound waves If a source is transmitting electromagnetic wave of frequency 8.2×10⁶ Hz, then wavelength transmitted from the source will be (a) 36.6 m (b) 40.5 m (c) 42.3 m (d) 50.9 m In an apparatus, the electric field was found to oscillate with an amplitude of 18 V/m. The magnitifield will be (a) 4×10⁻⁶ T (b) 6×10⁻⁸ T (c) 9×10⁻⁹ T (d) 11×10⁻¹¹ T According to Maxwell's hypothesis, a changing electric field gives rise to (a) An e.m.f. (b) Electric current (c) Magnetic field (d) Pressure radiant In an electromagnetic wave, the electric and magnetizing fields are 100 V m⁻¹ and 0.265 A m⁻¹ is (a) 26.5 W/m² (b) 36.5 W/m² (c) 46.7 W/m² (d) 765 W/m² The 21 cm radio wave emitted by hydrogen in interstellar space is due to the interaction calle atomic hydrogen. the energy of the emitted wave is nearly (a) 10⁻¹⁷ Joule (b) 1 Joule (c) 7×10⁻⁸ Joule (d) 10⁻²⁴ Joule TV waves have a wavelength range of 1-10 meter. Their frequency range in MHz is (a) 30-300 (b) 3-30 	b, b < c (d) aves and visible light in value velocity but different what in absorption spectrum at absorption spectrum at emission spectrum at the emission spectrum (b) (d) (d) (d) (d) (d) (d) (d) (d) (d) (d	c < c (d) $a < b, b < cis and visible light in vacuum haveelocity but different wavelengthhous emission spectrumposorption spectrumhission spectrumand in electromagnetic oscillations is in the form ofthe energy (b) Magnetic energyand (b) (d) None of these$		
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TV waves have a wavelength range of 1-10 <i>meter</i> . Their frequency range in <i>MHz</i> is				
			name in MIII.	
(a) 50-500 (b) 5-50			range in MHz is	
(a) 200 2000 (d) 2 2000				
(c) 300-3000 (d) 3-3000 Mayurall's equations describe the fundamental laws of				
. Maxwell's equations describe the fundamental laws of	s equations describe the	quations describe the fundamental laws of		
(a) Electricity only (b) Magnetism only	etricity only (b)	ity only (b) Magnetism only		
(a) Electricity only (b) Magnetism only (c) Mechanics only (d) Both (a) and (b)				
The oscillating electric and magnetic vectors of an electromagnetic wave are oriented along			wave are oriented slo	ng.
(a) The same direction but differ in phase by 90°			wave are oriented afor	nig
(a) The same direction but differ in phase by 90° (b) The same direction and are in phase				
(c) Mutually perpendicular directions and are in phase		and the second of the second o		
(d) Mutually perpendicular directions and differ in phase by 90°				
(d) Mutuarly perpendicular directions and differ in phase by 90°. In which one of the following regions of the electromagnetic spectrum will the vibrational motors and differ in phase by 90°.				1
absorption		of the following regions of the electromagnet	trum will the vibratio	anal motion of
(a) Ultraviolet (b) Microwaves			trum will the vibratio	onal motion of
(c) Infrared (d) Radio waves	on	olet (b) Microwaves	trum will the vibratio	onal motion of

38.	An electromagnetic wave to such a wave	ravels along z-axis. Which of the following pairs of space and time varying fields would generate
	(a) E_x, B_y	(b) E_y, B_x
	(c) E_z, B_x	(d) E_y, B_z
39.		s has the maximum frequency
	william of the foliowing full	
	(a) Gamma rays	(b) Blue light
	(c) Infrared rays	(d) Ultraviolet rays
40.	A signal emitted by an ante	nna from a certain point can be received at another point of the surface in the form of
	(a) Sky wave	(b) Ground wave
	(c) Sea wave	(d) Both (a) and (b)
41.	Approximate height of ozor	ne layer above the ground is
	(a) 60 to 70 <i>km</i>	(b) 59 km to 80 km
	(c) 70 km to 100 km	(d) 100 km to 200 km
42.	The electromagnetic waves	do not transport
	(a) Energy	(b) Charge
	(c) Momentum	(d) Information
43.	A plane electromagnetic wa	ave is incident on a material surface. If the wave delivers momentum p and energy E , then
	(a) $p = 0, E = 0$	(b) $p \neq 0, E \neq 0$
	(c) $p \neq 0, E = 0$	(d) $p = 0, E \neq 0$
44.	An electromagnetic wave, g	going through vacuum is described by $E = E_0 \sin(kx + \omega t)$. Which of the following is independent
	of wavelength	
	(a) <i>k</i>	(b) ω
	(c) k/ω	(d) $k\omega$
45.		going through vacuum is described by $E = E_0 \sin(kx - \omega t)$; $B = B_0 \sin(kx - \omega t)$. Which of the
	following equation is true	
	(a) $E_0 k = B_0 \omega$	(b) $E_0\omega = B_0k$
	(c) $E_0 B_0 = \omega k$	
46.	An LC resonant circuit continuous wavelength of the radiated	tains a 400 pF capacitor and a 100 μ H inductor. It is set into oscillation coupled to an antenna. The
	(a) 377 mm	(b) 377 metre
	(c) 377 cm	(d) 3.77 cm
47.		at is $2 m$ long is oriented along the direction of the electromagnetic wave and receives a signal of
-7.		The maximum instantaneous potential difference across the two ends of the antenna is
	(a) $1.23 \mu V$	(b) 1.23 mV
	(c) 1.23 V	(d) $12.3 mV$
48.		t from the moon can be received on the earth while the TV broadcast from Delhi cannot be received
		ant from Delhi. This is because
	(a) There is no atmosphere	e around the moon
	(b) Of strong gravity effect	t on TV signals
	(c) TV signals travel straig	ght and cannot follow the curvature of the earth
	(d) There is atmosphere ar	round the earth
49.	A TV tower has a height of	$100 m$. The average population density around the tower is $1000 \text{ per } km^2$. The radius of the earth is
	6.4×10^6 m. the population	covered by the tower is
	(a) 2×10^6	(b) 3×10^6
	(c) 4×10^6	(d) 6×10^6
	(-)	

50.	The wavelength 21 cm emitte	ed by atomic hydrogen in interstellar space belongs to
	(a) Radio waves	(b) Infrared waves
	(c) Microwaves	(d) γ-rays
51.		lly proved the existence of electromagnetic waves
J1.	(a) Sir J.C. Bose	(b) Maxwell
	(c) Marconi	(d) Hertz
52.		frequency $v = 3.0 MHz$ passes from vacuum into a dielectric medium with permittivity $\varepsilon = 4.0$.
	Then	
	(a) Wavelength is doubled	and the frequency remains unchanged
	(b) Wavelength is doubled	and frequency becomes half
	(c) Wavelength is halved an	nd frequency remains unchanged
	(d) Wavelength and frequen	ncy both remain unchanged
53.	Frequency of a wave is 6×1	0^{15} Hz. The wave is
	(a) Radio wave	(b) Microwave
	(c) X-ray	(d) None of these
54.	The region of the atmosphere	e above troposphere is known as
	(a) Lithosphere	(b) Upper sphere
	(c) Ionosphere	(d) Stratosphere
55.		romagnetic waves have minimum frequency
	(a) Microwaves(c) Ultrasonic waves	(b) Audible waves
56.	Which one of the following l	(d) Radio waves
20.	Which one of the following i	ave minimum wavelength
	(a) Ultraviolet rays	(b) Cosmic rays
	(c) X-rays	(d) γ – rays
57.	Radiations of intensity 0.5	W/m^2 are striking a metal plate. The pressure on the plate is
	(a) $0.166 \times 10^{-8} \ N/m^2$	(b) $0.332 \times 10^{-8} \ N/m^2$
	(c) $0.111 \times 10^{-8} \ N/m^2$	(d) $0.083 \times 10^{-8} N/m^2$
58.	Electromagnetic waves trave of the electromagnetic wave	el in a medium which has relative permeability 1.3 and relative permittivity 2.14. Then the speed in the medium will be
	(a) $13.6 \times 10^6 m / s$	(b) $1.8 \times 10^2 m / s$
	(c) $3.6 \times 10^8 m/s$	(d) $1.8 \times 10^8 \ m \ / \ s$
59.	The intensity of gamma radia	ation from a given source is I. On passing through 36 mm of lead, it is reduced to $\frac{1}{8}$. The thickness
		, <u> </u>
	of lead which will reduce the	intensity to $\frac{1}{2}$ will be
	(a) 18 <i>mm</i>	(b) 12 mm
	(c) 6 mm	(d) 9 mm
60.	If λ_v, λ_r and λ_m represent t	he wavelength of visible light x-rays and microwaves respectively, then
	(a) $\lambda_m > \lambda_x > \lambda_v$	(b) $\lambda_v > \lambda_m > \lambda_y$
	(c) $\lambda_m > \lambda_v > \lambda_v$	
61.		a 10 MHz signal, what should be the minimum electron density in ionosphere
01.	(a) $\sim 1.2 \times 10^{12} m^{-3}$	
	(a) $\sim 1.2 \times 10^{-6} m$ (c) $\sim 10^{14} m^{-3}$	(b) $\sim 10^{8} \text{ m}$ (d) $\sim 10^{22} \text{ m}^{-3}$
62.		(d) $\sim 10^{\circ}$ m electromagnetic wave of intensity I (watts/ m^2) on a nonreflecting surface is [c is the velocity of
,	light]	(b) Ic^2
	(a) Ic	(b) Ic (d) I/c^2
63.	(c) <i>I/c</i> Infrared radiation was discov	
00.	initated radiation was discov	cica in 1000 by
	(a) William Wollaston	(b) William Herschel

- (c) Wilhelm Roentgen
- (d) Thomas Young
- **64.** Which of the following is electromagnetic wave
 - (a) X-rays and light waves
 - (b) Cosmic rays and sound waves
 - (c) Beta rays and sound waves
 - (d) Alpha rays and sound waves
- **65.** Which one of the following is not electromagnetic in nature
 - (a) X-rays
- (b) Gamma rays
- (c) Cathode rays
- (d) Infrared rays
- Light wave is travelling along y-direction. If the corresponding \vec{E} vector at any time is along the x-axis, the direction of \vec{B} **66.** vector at that time is along
 - (a) y-axis
 - (b) x-axis
 - (c) +z-axis
 - (d) -z axis
- If c is the speed of electromagnetic, waves in vacuum, its speed in a medium of dielectric constant K and relative permeability **67.**
 - (a) $v = \frac{1}{\sqrt{\mu_r K}}$ (b) $v = c\sqrt{\mu_r K}$ $v = \frac{c}{\sqrt{\mu_r K}}$ (d) $v = \frac{K}{\sqrt{\mu_r C}}$
- (c)



1	а	2	d	3	b	4	d	5	b
6	b	7	а	8	d	9	С	10	а
11	а	12	С	13	а	14	b	15	b
16	d	17	b	18	d	19	а	20	С
21	а	22	d	23	С	24	b	25	а
26	а	27	С	28	С	29	а	30	b
31	С	32	а	33	d	34	а	35	d
36	С	37	b	38	а	39	а	40	d

41	а	42	b	43	b	44	С	45	а
46	b	47	а	48	С	49	С	50	а
51	С	52	С	53	d	54	d	55	b
56	b	57	а	58	d	59	b	60	С
61	а	62	С	63	b	64	а	65	С
66	d	67	С						

