

## ANSWERS KEY

1. (b)	31. (c)	61. (a)	91. (a)
2. (b)	32. (c)	62. (c)	92. (c)
3. (c)	33. (a)	63. (a)	93. (b)
4. (b)	34. (c)	64. (a)	94. (c)
5. (c)	35. (c)	65. (b)	95. (c)
6. (d)	36. (d)	66. (a)	96. (c)
7. (d)	37. (b)	67. (c)	97. (d)
8. (d)	38. (c)	68. (b)	98. (d)
9. (a)	39. (a)	69. (b)	99. (c)
10. (d)	40. (a)	70. (a)	100. (c)
11. (a)	41. (c)	71. (c)	101. (a)
12. (a)	42. (c)	72. (b)	102. (a)
13. (c)	43. (d)	73. (c)	103. (b)
14. (b)	44. (b)	74. (d)	104. (c.)
15. (b)	45. (b)	75. (a)	105. (c)
16. (c)	46. (d)	76. (c)	106. (b)
17. (a)	47. (b)	77. (a)	107. (d)
18. (c)	48. (b)	78. (b)	108. (d)
19. (d)	49. (c)	79. (d)	109. (d)
20. (a)	50. (b)	80. (c)	110. (a)
21. (d)	51. (d)	81. (b)	111. (a)
22. (b)	52. (c)	82. (b)	112. (a)
23. (c)	53. (b)	83. (c)	113. (c)
24. (c)	54. (d)	84. (a)	114. (c)
25. (a)	55. (a)	85. (c)	115. (c)
26. (a)	56. (b)	86. (c)	116. (c)
27. (b)	57. (a)	87. (b)	117. (b)
28. (c)	58. (d)	88. (d)	118. (d)
29. (b)	59. (c)	89. (d)	119. (b)
30. (c)	60. (c)	90. (a)	120. (a)

1. (b)
2. (b)
3. (c)
4. (b)
5. (c)
6. (d)

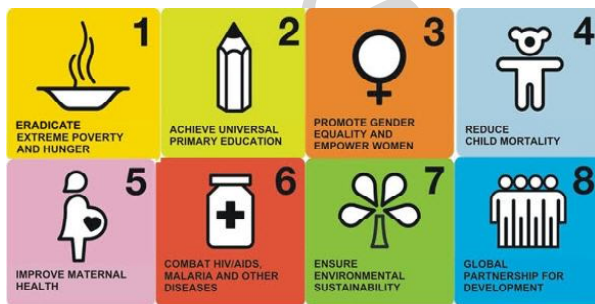
**Exp:** The 2016 'World Press Freedom Index' released by Reporters Without Borders (RSF) is led by Finland, which retained its top spot for the sixth consecutive year, followed by Netherlands and Norway. India ranks abysmally low at 133 among 180 countries. Among India's neighbouring countries, Pakistan ranks 147, Sri Lanka (141), Afghanistan (120), Bangladesh (144), Nepal (105) and Bhutan (94). China is ranked 176.

7. (d)

Missile	Type, Details	From-To	Range	Weight	War-head
Akash	Short Range	Surface to air	30 Km	720 Kg	60 Kg
Trishul	Short range for Navy	Surface to air	9 Km	130 Kg	5 Kg
Nag	Fire and forget, anti-tank, guided	Surface to surface, Air to surface	4 Km	42 Kg	8 Kg
Brahmos	Cruise missile	Land, Naval, Air	300 Km	3 T	200 Kg

8. (d)

**Exp:**



9. (a)

**Exp:** The Union Ministry of Women and Child Development has launched Protection of Children from Sexual Offences (POCSO) e-box, in New Delhi. POCSO e-box is an online complaint management system for easy and direct reporting of sexual offences against children and timely action against offenders under POCSO Act, 2012.

10. (d)

**Exp:** Yoga, India's one of the ancient practices has now been inscribed as an element in the

UNESCO's list of Intangible Cultural Heritage of humanity during the 11th session of the Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage held in Addis Ababa, Ethiopia.

Yoga has become the 13th intangible cultural heritage that has been listed from India so far with UNESCO.

Previous ones includes:

- Chhau dance (Inscribed in 2010),
- the Buddhist chanting of Ladakh (inscribed in 2012),
- Sankirtana –the ritual singing, drumming, and dancing of Manipur (inscribed in 2013),
- the traditional brass and copper craft of utensil making among the Thatheras of Jandiala Guru,
- Punjab (inscribed in 2014) and
- Ramlila- the traditional performance of the Ramayana (inscribed in 2008).

11. (a)

**Exp:** Since 1992, the United Nations International Day of Persons with Disabilities (IDPD) has been celebrated annually on **3 December** around the world. The **theme** for this year's International Day is "**Achieving 17 Goals for the Future We Want**". This theme notes the recent adoption of the 17 Sustainable Development Goals (SDGs) and the role of these goals in building a more inclusive and equitable world for persons with disabilities.

12. (a)

**Exp:** The 6th Heart of Asia (HoA) ministerial conference has started at Amritsar in Punjab on December 4, 2016 with focus on tackling terror in region. The conference will discuss peace, cooperation and economic development in Afghanistan. The theme of the conference is "Addressing Challenges, Achieving Prosperity".

13. (c)

**Exp:** The Union Tribal Affairs Minister JualOram launched 'Stanpan Suraksha' mobile application to promote breastfeeding and keep a tab on "inappropriate" promotion of baby food items. The mobile application has been developed by the Breastfeeding Promotion Network of India (BPNI).

14. (b)

**Exp:** In its thirty eighth flight (PSLV-C36), ISRO's Polar Satellite Launch Vehicle

successfully launched the 1235 kg RESOURCESAT-2A Satellite on December 07, 2016 from Satish Dhawan Space Centre SHAR, Sriharikota. This is the thirty seventh consecutively successful mission of PSLV.

15. (b)

**Exp:** The 5th India-Arab Partnership Conference will be held in **Muscat, Oman** on December 14, 2016 with an objective to enhance the economic relations between India and Arab countries and **Oman**.

16. (c)

**Exp:** Recognizing the importance of developing the online River Water and Air Quality Monitoring (WAQM) systems, **Department of Science and Technology (DST)**, Government of India and **Intel** are collaborating to jointly initiate "DST-Intel Collaborative Research for Real-Time River Water and Air Quality Monitoring" soliciting proposals from Academic/Research Institutions and providing grant-in-aid support to the selected project(s).

17. (a)

**Exp:** Sikkim has become India's first fully organic state by converting around 75,000 hectares of agricultural land into sustainable cultivation.

18. (c)

**Exp:** The **Golden Quadrilateral** is a highway network connecting many of the major industrial, agricultural and cultural centres of India. A quadrilateral of sorts is formed by connecting **Chennai, Kolkata, Delhi and Mumbai**, and hence its name. Other metropolises also connected by the network are Ahmedabad, Bengaluru, Bhubaneswar, Jaipur, Kanpur, Pune, Surat, Nellore and Guntur.



19. (d)

**Exp:** The **Ramsar Convention** is an international treaty for the conservation and sustainable use of wetlands. It is also known as the **Convention on Wetlands**. It is named after the city of **Ramsar** in Iran, where the **Convention** was signed in 1971.

20. (a)

**Exp:** The permanent members of the United Nations Security Council, also known as the Permanent Five, Big Five, or P5, include the following five governments: **China, France, Russia, the United Kingdom, and the United States**. The members represent the five great powers considered the victors of World War II.

21. (d)

22. (b)

23. (c)

24. (c)

25. (a)

26. (a)

27. (b)

28. (c)

29. (b)

30. (c)

31. (c)

32. (c)

33. (a)

34. (c)

35. (c)

36. (d)

37. (b)

38. (c)

39. (a)

40. (a)

41. (c)

42. (c)

43. (d)

Normally ceramics contain a large number of flaw like minute surface or interior cracks, internal pores etc. So when they are subjected to tensile load, stress gets magnified at the cracks and pores and brittle fracture occur.

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44. (b)
45. (b) Composite in which the reinforcing fibres are long extending over the entire length of the material are called continuous fibre composite. These composite are highly anisotropic. The tensile or compressive strength of composite is high in direction parallel to the fibres and quite low in the direction perpendicular to the fibres.
46. (d) Thermal conductivity of aluminium is  $247 \text{ Wm}^{-1}\text{K}^{-1}$ , glass it is  $1.7 \text{ Wm}^{-1}\text{K}^{-1}$  & for perspex it is  $0.15 = 0.21 \text{ Wm}^{-1}\text{K}^{-1}$ . The material which have lower value of thermal conductivity is perfectly insulator.
47. (b)
48. (b) Thermal conductivity is as follows gold > silver > copper > Aluminium
49. (c) **Note:** The mean displacement of atom in crystal is due to temperature and is inversely proportional to force constant responsible for potential energy of atom.
- In strongly bonded solid (covalent, ionic) the force constant is very high so mean displacement and hence the expansion coefficient will be small. For weakly bonded solids it is opposite of strongly bonded crystal.
50. (b) **Note:** Thermal conductivity may also expressed as  $\text{Wm}^{-1}\text{K}^{-1}$ .
51. (d)
52. (c)
53. (b)

We know that  $\lim_{x \rightarrow 0} \frac{\sin x}{x} \rightarrow 1^-$  and

$$\lim_{x \rightarrow 0} \frac{x}{\sin x} \rightarrow 1^+$$

$$\therefore \lim_{x \rightarrow 0} \left( \left[ \frac{100x}{\sin x} \right] + \left[ \frac{99 \sin x}{x} \right] \right)$$

$$= 100 + 99 = 199$$

54. (d)

$f(x)$  has extremum at  $x = \frac{\pi}{3} \Rightarrow f'(\pi/3) = 0$

$$f(x) = a \sin x + \frac{1}{3} \sin 3x$$

$$f'(x) = a \cos x + \cos 3x$$

$$f'(\pi/3) = a \cos \frac{\pi}{3} + \cos \pi = 0$$

$$\Rightarrow a = 2$$

55. (a)

$$\text{Let } I = \int_0^{\infty} \frac{x \log x}{(1+x^2)^2} dx$$

$$\text{let } x = \frac{1}{t}$$

$$d = -\frac{1}{t^2} dt$$

$$\Rightarrow I = \int_{\infty}^0 \frac{\frac{1}{t} \log \frac{1}{t}}{\left(1 + \frac{1}{t^2}\right)^2} \left(-\frac{1}{t^2}\right) dt$$

$$= \int_{\infty}^0 \frac{t \log t}{(1+t^2)^2} dt$$

$$I = -I$$

$$\Rightarrow I = 0$$

56. (b)

Required Probability

$$= \frac{\frac{2}{10} \times 1}{\frac{2}{10} \times 1 + \frac{3}{10} \times 0 + \frac{5}{10} \times \frac{1}{2}} = \frac{4}{9}$$

57. (a)

By Green's theorem

$$\oint_C (\cos x \sin y - xy) dx + \sin x \cos y dy$$

$$= \iint_R (\cos x \cos y - \cos x \cos y + x) dx dy$$

$$= \iint_R x dx dy$$

$$= \int_0^{2\pi} \int_0^1 r \cos \theta r dr d\theta$$

$$= \int_0^{2\pi} \cos \theta \left[ \frac{r^3}{3} \right]_0^1 d\theta$$

$$= \frac{1}{3} [\sin \theta]_0^{2\pi} = 0$$

58. (d)

$$\vec{f} = 3xz\hat{i} + 2xy^2\hat{j} - xyz^2\hat{k}$$

$$\nabla \cdot \vec{f} = 3z + 4xy - 2xyz$$

$$\begin{aligned} \nabla \cdot \vec{f} &= 3(2) + 4(1)(-1) - 2(1)(-1)(2) \\ &= 6 - 4 + 4 = 6 \end{aligned}$$

59. (c)

$$F(s) = \log \frac{s+1}{s-1} = \log(s+1) - \log(s-1)$$

$$L[t f(t)] = -\frac{d}{ds}[F(s)]$$

$$= -\frac{d}{ds}[\log(s+1) - \log(s-1)]$$

$$= -\left[\frac{1}{s+1} - \frac{1}{s-1}\right]$$

$$L[t f(t)] = \frac{2}{s^2 - 1}$$

$$t f(t) = L^{-1}\left[\frac{2}{s^2 - 1}\right]$$

$$t f(t) = 2\sinh t$$

$$f(t) = \frac{2}{t} \sinh t$$

60. (c)

61. (a)

62. (c)

63. (a)

64. (a)

65. (b)

66. (a)

67. (c)

68. (b)

69. (b)

70. (a)

71. (c)

72. (b)

73. (c)

74. (d)

75. (a)

76. (c)

77. (a)

78. (b)

79. (d)

80. (c)

81. (b)

82. (b)

83. (c)

84. (a)

85. (c)

86. (c)

87. (b)

88. (d)

89. (d)

90. (a)

91. (a)

92. (c)

93. (b)

94. (c)

95. (c)

96. (c)

97. (d)

98. (d)

99. (c)

100. (c)

101. (a)

102. (a)

Exp: Theory of justice is given by rawls, where he talks about distribution of resources in such a manner that giving extra to someone does not hurt the others.

103. (b)

104. (c)

105. (c) The other two are routine features of any career service.

106. (b) is the best option.

107. (d)

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108. (d)

"meta ethics" is concerned with the meaning of terms used in ethics as a discipline..

109. (d)

Politicization is a trait opposite to bureaucracy.

110. (a) This is the biggest ethical issue

111. (a)

**Exp:** In Plato's Republic, the four cardinal virtues are **wisdom, temperance, courage** and justice. These reflect the nature of the soul.

112. (a) 
$$EOQ = \sqrt{\frac{2DC_0}{C_c}}$$

$$EOQ' = \sqrt{\frac{2(2D) \times \frac{C_0}{2}}{C_c}} = \sqrt{\frac{2DC_0}{C_c}} = EOQ$$

113. (c)

114. (c)

115. (c)

116. (c)

117. (b)

118. (d)

119. (b)

120. (a)

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